

**EXHIBIT 1**  
[UNREDACTED VERSION OF  
DOCUMENT SOUGHT TO BE SEALED]

# Grenada SBS SAD Final 4/28/11

Grenada Core Team  
Seagate Technology



Product Name: Grenada

Approval Date: April 27, 2011

Design Center: LCO

Goal: Authorizes SAD Shipments to SBS; Q4'11 forward

Volume Factory: Korat

Configuration: 1TB, 2TB, 3TB SATA

## Design Center Approval:

Pat Dewey  
Pat Dewey  
Core Team Lead

Brant VanDerVliet  
Brant VanDerVliet  
Exec Dir Prd Eng

Frank Murphy  
Frank Murphy  
Dir Rel

Mike Kepler  
Mike Kepler  
Exec Dir Materials

James Grassman  
James Grassman  
Ex Dir PLM

Mike Foye  
Mike Foye  
TCM Exec Dir

Kris McNichols  
Kris McNichols  
Sr. Dir Finance

Kian Fatt Chong  
Kian Fatt Chong  
VP Mfg

Jeff Mason  
Jeff Mason  
VP Design Eng

John D Griedl  
John D Griedl  
Sr. VP QA, Customer Advocacy

Andy Davis  
Andy Davis  
Sr. VP DE, MDO Design & Development

# SBS Ship Approval

Product Name: Grenada Approval Date: 4/27/2011  
 Design Center: LCO Goal: Commence SBS Shipments  
 Volume Factory: Korat Configuration: 1TB, 2TB, 3TB

|    | CRITERIA  |   | EXCEPTIONS/ STATUS |             |              | MET?                                    |                             |
|----|---|---|--------------------|-------------|--------------|---|-----------------------------|
| 1a | <b>Integration DPPM Goal Achieved</b><br><i>Demo ≤ 8,000 dppm</i>   | <b>DEMO</b>   | <b>RAW</b>         | <b>DEMO</b> | <b>PROJ.</b> | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
|    |   | ≤ 8k DPPM   |                    | 6.8K        | N/A          |   |                             |
| 1b | <b>168-Hr DPPM Goal Achieved</b><br><i>Demo ≤ dppm</i>  | <b>DEMO</b>   | <b>RAW</b>         | <b>DEMO</b> | <b>PROJ.</b> | N/A                                     |                             |
|    |   | N/A DPPM  |                    |             |              |   |                             |
| 2  | <b>MTBF Goal Achieved</b><br><i>Demo ≥ 100 k hrs</i><br><br>SBS Mini RDT completed/fit for use  | <b>DEMO</b>   | <b>RAW</b>         | <b>DEMO</b> | <b>PROJ.</b> | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
|    |   | ≥ 100k Hrs  |                    | 101K        | 167K         |   |                             |
| 3  | <b>Gen 2/3 Product Assurance and Factory Testing Complete</b><br>- SBS DMT testing and Reliability subset of drive DMT testing  | In progress of Regressing 1D packaging test with proper packaging, low risk |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 4  | <b>Firmware/Compatibility Testing Complete</b><br>- SBS firmware and compatibility completed/fit for use and All High Risk items fix validated.   |   |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 5  | <b>Factory Prime Yields meet Phase 0 goals</b>  | Product Yields<br>1D: 76.8n, 2D: 67.8c, 73.2n 3D: 56.6n                     |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 6  | <b>Process Readiness Audit and Process Verification Test Results approved by Volume Factory and Design Center.</b><br>- Includes QA Hardware/Software Readiness and SBS approval        |   |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 7  | <b>Component sources defined on the SSP approved to ASL level AE/AB. Exceptions have defined/underpinned closure plans. Qualified Sources can support Master Schedule Requirements.</b> | 1.  |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 8  | <b>Product Stewardship Declaration of Compliance has been issued per Corporate Product Stewardship Certification Process.</b>   | 1.  |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 9  | <b>Inventory / Material Disposition</b><br>- Complete roll-up of all Factory and DC pre-SAD config inventory/WIP/FG and Disposition.  | 1   |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 10 | <b>All other exceptions to the CTU Ship Approval Document have been closed.</b>   | Korean Certification . Not a gate for SBS.                                  |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| 11 | <b>Complexity Health Index</b><br>- Does not deviate from Phase 0 Contract  | A. CH Index Score = 296<br>B. CC Budget = 80                                |                    |             |              | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |

Applies to Rockit SBS Product, others in progress!





# Grenada Executive Summary

## Drive Development Phase: GEN2

| Milestone   | Phase 0   | Gen 1      | Gen2       | SBS       | CTU       | Disty     | OEM       |
|-------------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| Outlook     | 3/24/2010 | 10/26/2010 | 3/18/2011  | 4/29/2011 | 6/15/2011 | 6/15/2011 | 7/30/2011 |
| Phase 0 Con | 4/14/2010 | 9/2/2010   | 12/15/2010 | 4/10/2011 | 5/10/2011 | 5/10/2011 | 7/30/2011 |


| MS1106-A1     | Q4'11 Total | Q1'112Total | Q2'12 Total |
|---------------|-------------|-------------|-------------|
| GRENADA 1TB   | 110,830     | 1,101,543   | 3,342,524   |
| GRENADA 1.5TB | 0           | 68,305      | 132,236     |
| GRENADA 2TB   | 124,589     | 1,044,879   | 2,920,364   |
| GRENADA 2.5TB | 0           | 0           | 0           |
| GRENADA 3TB   | 79,995      | 135,273     | 618,414     |
| GRENADA Total | 315,414     | 2,350,000   | 7,013,538   |

### Key Message:

Added 692 drives (Mat2.0) with CA's in PC0 8.1 and at a average of 433 hours. Key learning from this regression will be the reduction of degraded readers and new media defects. Currently demo 101KMTBF and potential of 167K. Mat2.0 by itself is demo of 99K and 251K potential MTBF. DPPM currently at 6808 average

Based on the meeting the SBS SAD metrics, I will present package to SMT for SAD approval.

Restarted build of MPT suspensions and HGA builds for Grenada/Bacall and some early mass production.

**Engineering:**  mode in the Mat2.0 bed from Prism/Zest feature, flashed up the entire bed to new servo code with fix,

47KHz work in progress. DETCR disable not a major contributor, clearance hump testing regressing and SWD adjust work. 47KHz modulated writes strongly influenced by altitude and low skew clearance settings, failing HGA's sent to RHO for root cause and CA's. RHO has recreated the problem and working with MPT to define CA's. TDK version is very quiet in this frequency range and NHK testing in progress.

~~Released new EAW test specs and investigating chunk qual result wafer failure criteria.~~

### Reli Metrics:

Krishnan is working Native and BTC HGA specs and S5+ multi disc drive yields, yield update in package.

BLODT – Gen2 Demo/Regress and SBS Reli drives demo to 6.8K DPPM, early mass production qty 1.2K yielded 4.2K

~~TVM – 1D 2D and 3D's pass TVM at ~93%~~

### Challenges:

RDT – MTBF Demo at 101K with Mat 1.2/1.3 plus Mat2.0 regression drives.  
Manage new feature integration, get ready for RDT!

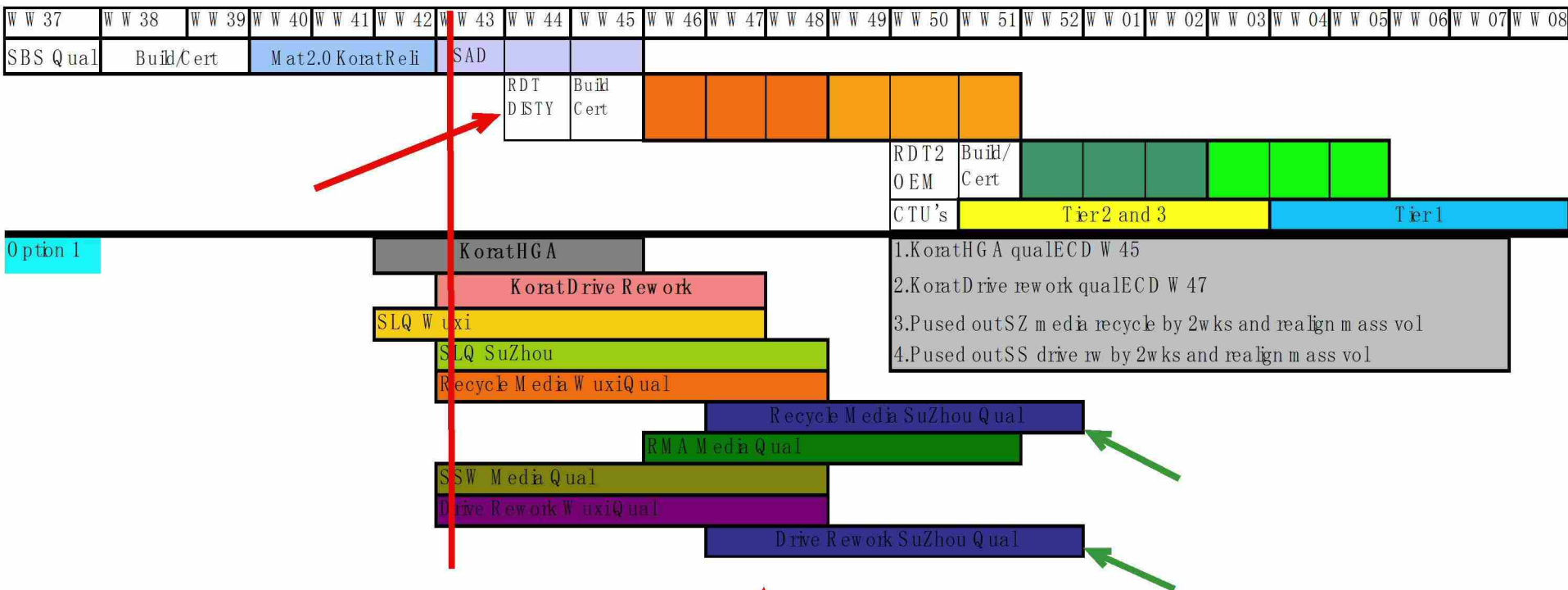
Grow MTBF and reduce DPPM quickly!



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# Grenada – Time Line



Disty RDT, supporting PCO at risk to push to WW45.↑

- Bottom Depop HD0 support, will also support the any head electrical depop functionality.

SuZhou Drive RW, and Recycle Media, Quals move out 2 weeks.↑

Drive rework .... Reli update pending.

Media recycle ..... 9 failures pending FA, CA.

SSW Media qual inclusive to Mechanical Depop qualification currently in Disty RDT.

GHG qualification ..... 3 Leg evaluation started, Reliability requirements pending, RGA and ODT.





# Reliability



04/27/2011

## Metric Highlights

### DPPM:

•7 Day MAV

| Korat | Wuxi | Suzhou | Demo |
|-------|------|--------|------|
| NA    | NA   | NA     | 6.8k |

•Goal:

| Gen2 | SBS | CTU | SAD | Vol. |
|------|-----|-----|-----|------|
| 20k  | 8k  | 4k  | 2k  | 500  |

### MTBF:

•Demo:

| Validated | Potential |
|-----------|-----------|
| 101k      | 167k      |

•Goal:

| Gen 2: | SBS SAD | SAD  |
|--------|---------|------|
| 50k    | 100k    | 250k |

### TVM:

| Pass Rate | Gen2 Goal: |
|-----------|------------|
| 92%       | 90%        |

## Next Phase Gate/Schedule

| Milestone | Date |
|-----------|------|
| SBS SAD   | TBD  |

## Top Issues

### MAT 2.0

- 1x Unclassified IOEDC/IOECC Failure
- 1x Head Instability Failure

### SBS Box Testing - Raptor

- Thermal Limit Exceeded – 11C over spec
- 2x Op-Table Drop Failures – Drives in FA

### DMT

- 3 Disk Failure for Z-Height Dimension
- Regression of Package Testing
- Korean Cert

## FA / Issue Summary

### Open PFLs

| Total | < 7 Days | 7-15 Days | 15-21 Days | 21-28 Days | > 28 Days |
|-------|----------|-----------|------------|------------|-----------|
| 134   | 44       | 24        | 23         | 11         | 32        |

### Issues

| Total | Open | CA Imp. | CA Ver. | Unresolved |
|-------|------|---------|---------|------------|
| 70    | 13   | 33      | 24      | 0          |

### SSO:

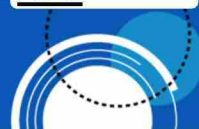
•None

### DA:

•None

## Near-term Schedule

- RDT 1 Testbed – tbd
- 10k MDW Qual – ww 44





## MAT 1.2/1.3/BtC/2.0

Updated: 4/27/11 12:00 AM

|                          |         |   |
|--------------------------|---------|---|
| AFR (1st year Weibull)   | 7.006%  | From all fails Weibull MLE                        |
| MTBF (1st year Weibull)  | 33040.3 |   |
| Minimum AFR:             | 0.032%  | From zero fail Weibull @ 50% CL                   |
| Total Number of Failures | 129     |   |
| AFR for 1 failure        | 0.054%  | AFR decrease per failure @ 100% fix effectiveness |

|          |                    |
|----------|--------------------|
| 1651     | Qty                |
| 2400     | POH/Year           |
| 0.608098 | Weibull Beta       |
| 740      | Average Test Hours |

| Issue   | Corrective Action  | Fix Validation  | # of Failures | % Fail | Eff. Factors |           | Reduced AFR |           | PFL/TF   |
|---|--|---|---------------|--------|--------------|-----------|-------------|-----------|--|
|   |  |   |               |        | Demo'd       | Potential | Demo'd      | Potential |  |
| SPPL-043: Head Instability MAT1.2/1.3                 | Reducing the number of zones tested in T135<br>Increasing the minimum skew angle by moding ID zones out<br>We are using IPD2 and only IPD3 on global ret.  | Validation based on MAT 1.2/1.3/BtC failure rate in first 180 hours vs. MAT 2.0   | 23            | 1.243% | 74%          | 90%       | 6.086%      | 5.887%    | PFL-0701/879,PFL-0457/703,PFL-0304/443,PFL-0624/705,PFL-0674/667,PFL-0472/420,PFL-0617/669,PFL-0499/484,PFL-0491/497,PFL-0655/765,PFL-0451/371,PFL-0420/272,PFL-0355/83,PFL-0374/130,PFL-0373/94,PFL-0602/777,PFL-0645/747,PFL-0277/779,PFL-0388/515,PFL-0340/445,PFL-0262/110,PFL-0339/441,PFL-0283/112 |
| SPPL-063: Encroachment due to ZEST/ATS                | xx5C Servo Code to fix the bug: variable i32_SeekDestinationCylinderLogical which we use to decide if we are in the system area or not, is not getting updated by ATS seeks.   | Validation of 11 failures in Korat with new servo code. Additionally 400 drives loaded in LCO with new servo code. 0 Failures                                     | 12            | 0.649% | 100%         | 100%      | 6.358%      | 6.358%    | PFL-0846/90,PFL-0863/146,PFL-0826/89,PFL-0836/125,PFL-0824/56,PFL-0825/55,PFL-0823/56,PFL-0862/54,PFL-0855/78,PFL-0811/16,PFL-0864/171,PFL-0348/126  |
| SPPL-041: Sequencer Halt - MAT1.2/1.3                 | FE_0121416_212104_MAKE_ALL_RETRIES_BE_RETRYABLE<br>Cut into AA5200 Cod   | No Failures in 5200+ Code in Reli testing. SIE has reported problem fixed in their lab.   | 10            | 0.541% | 100%         | 100%      | 6.466%      | 6.466%    | PFL-0702/459,PFL-0710/946,PFL-0671/834,PFL-0668/233,PFL-0500/428,PFL-0578/788,PFL-0637/727,PFL-0351/50,PFL-0319/351,PFL-0306/318   |
| SPPL-042: Missed Defect MAT1.2/1.3                    | 3.5T Flawscan<br>Odd/Even Flawscan<br>SERV Recove  | Validated on bench that failures are caught with 3.5T. Not detectable with current Flawscan.  | 10            | 0.541% | 80%          | 80%       | 6.574%      | 6.574%    | PFL-0383/226,PFL-0620/605,PFL-0504/574,PFL-0644/753,PFL-0419/276,PFL-0302/34,PFL-0336/39,PFL-0352/81,PFL-0385/200,PFL-0271/19  |
| SPPL-044: New Defect MAT 1.2/1.3                      | Import Particle Sweep MQM from MantaRay. ECD 2/28  | Validation based on MAT 1.2/1.3/BtC failure rate in first 180 hours vs. MAT 2.0   | 9             | 0.487% | 20%          | 40%       | 6.909%      | 6.812%    | PFL-0669/861,PFL-0496/441,PFL-0433/371,PFL-0370/159,PFL-0278/90,PFL-0310/68,PFL-0316/73,PFL-0206/212,PFL-0354/426  |
| SPPL-051: BERP Retry Bug MAT1.2/1.3                   | AA6900 F3 Code   | Validation on all failures flashed with AA6900 Code.  | 7             | 0.378% | 80%          | 80%       | 6.704%      | 6.704%    | PFL-0501/791,PFL-0677/893,PFL-0335/24,PFL-0421/310,PFL-0337/26,PFL-0397/252,PFL-0392/273   |
| SPPL-045: Offtrack/Encroachment due to MDW DC Squeeze | PRIZM/ZEST to be implemented in PC0 008  | Validation in Process on PFLs 317, 353, and 390 that were processed with PC0-008. Currently at 168 hours. 75% FE @ 185 hours                                      | 6             | 0.324% | 80%          | 80%       | 6.747%      | 6.747%    | PFL-0600/573,PFL-0651/732,PFL-0470/408,PFL-0317/882,PFL-0353/473,PFL-0390/237  |
| SPPL-061: 47kHz Modulation - Gimble Yaw Mode          | Moved MD contact detect zones to higher skew<br>Increased revolutions at low skew zones (from 30 to 50) to improve contact detect SNR<br>Optimized AGC detector for Luxor 2 compatibility<br>Reduced FFT frequency binning to accommodate servo sample rate/ gimbal mode overl | Failure rate of 47kHz Mode on all Pre MAT 2.0 PCOs vs. MAT 2.0 PCO drives   | 6             | 0.324% | 50%          | 67%       | 6.844%      | 6.789%    | PFL-0716/1000,PFL-0720/1000,PFL-0714/1000,PFL-0715/1000,PFL-0718/1000,PFL-0717/1000  |
| SPPL-046: Skip Write MAT 1.2/1.3                      | AFS 5.2 implemented in PC0008  | Validation with MAT 2.0 Testbed (no failures) vs MAT 1.2/1.3 testbed which had 5 failures.  | 5             | 0.270% | 80%          | 80%       | 6.790%      | 6.790%    | PFL-0519/522,PFL-0635/668,PFL-0304/208,PFL-0349/445,PFL-0394/273   |
| SPPL-064: 20kHz Modulation - Suspension Sway Mode     | Short Term: T180 Changes + Iris 4.5<br>Long Term: Iris 4.6 Change  | Failures in MAT 2.0 show 2kHz modulation in addition to the 20kHz. This has an affect on servo loop stability and is a contributing factor to the 20kHz failures. | 5             | 0.270% | 20%          | 75%       | 6.952%      | 6.804%    | PFL-0885/153,PFL-0882/241,PFL-0818/20,PFL-0821/16,PFL-0272/37  |

|   |   |   |     |                      |      |      |        |        |   |
|---|---|---|-----|----------------------|------|------|--------|--------|---|
| SPPL-039: Hard Errors Due To Ineffective DC Gap Recovery                      | Register Change: 0x1ac=0x79BF & 0x73=0x137 to set gap recovery after read instead of gap recovery after servo.  | Validation of 9 total Grenada Bacall failures. 1 of 9 failures is not recoverable.                  | 4   | 0.216%               | 79%  | 80%  | 6.835% | 6.833% | PFL-0279102,PFL-0281115,PFL-0261914,PFL-0270114   |
| SPPL-049: Burnt 5V Regulator due to Transient - Fairchild                     | Non Issue for SBS. Resistor value change (10 to 1ohm) for added margin. Gren02 PCBA being worked for Disty/OEM customers  |   | 4   | 0.216%               | 100% | 100% | 6.790% | 6.790% | PFL-06221590,PFL-0273141,PFL-0274154,PFL-0357105  |
| SPPL-068: SwDT - Iris 4.3 Suspensions   | Iris 4.5 Gold PZT   | All 20 SwDT failures in Grenada with Iris 4.3. Only 325 drives tested with Iris 4.5 to date.        | 4   | 0.216%               | 72%  | 80%  | 6.851% | 6.833% | PFL-0819134,PFL-0827167,PFL-04451339,PFL-04921444 |
| SPPL-047: Low OTF due to initial integration of BIE                           | Opti 18 implemented in PCO 008  | Validation with MAT 2.0 testbed. No OTF dropout failures seen vs. 3 in Previous MAT 1.2/1.3 Testbed | 3   | 0.162%               | 75%  | 75%  | 6.885% | 6.885% | PFL-04251344,PFL-0371166,PFL-0372101              |
| SPPL-065: Weak Write due to Clearance Settling - MAT 2.0                      | Fix issue with PCO 8 disabling the weak write screen VBAR by HMS Phase 3 implementation   | Validation with these 3 failures sent back to the process to re-run weak write screen               | 3   | 0.162%               | 15%  | 60%  | 6.982% | 6.909% | PFL-081210,PFL-081310,PFL-080510                  |
| SPPL-040: VBAR by HMS bug causing loss of TPI margin                          | PCO 007.2 Fix for VBAR/HMS bug that over/under reported capability  | Validated with TVM data. 6/34 Failures in PCO 007 vs 0/90 in PCO 7.3                                | 2   | 0.108%               | 80%  | 80%  | 6.920% | 6.920% | PFL-05011450,PFL-0339126                          |
| SPPL-052: PZT due to physical to  | Fixed in x53B servo code  | Validated with x53B servo and later   | 2   | 0.108%               | 100% | 100% | 6.898% | 6.898% | PFL-05021501,PFL-03561173                         |
| SPPL-073: EAW - MAT 2.0   | PCO 8.6 - In checkout in factory. Cut in date ww44.<br>(If DELTA_BER_CHUNK1 < 0.48 OR DELTA_BER_CHUNK3 < 0.3, then the Drive passes. Alternately, If DELTA_BER_CHUNK1 >= 0.48 AND DELTA_BER_CHUNK3 >= 0.3, then the Drive fails.  |   | 2   | 0.108%               | 62%  | 80%  | 6.939% | 6.920% | PFL-09251307,PFL-0914165                          |
| SPPL-074: 47kHz Modulation - Gimble Yaw Mode - MAT 2.0                        | Short Term: DETCR Disabled in Runtime<br>Long Term: Iris 4.8 Chang  |   | 2   | 0.108%               | 0%   | 50%  | 7.006% | 6.952% | PFL-08341267,PFL-0845166                          |
| IOEDC Error   | NANYA DDR - PART DQ'd   |   | 1   | 0.054%               | 0%   | 100% | 7.006% | 6.952% | PFL-09401329                                      |
| SPPL-055: EAW/Pre Wafer Chunk Qual - Gen 1                                    | Wafer Chunk qual for EAW implemented ww38   | Validation on failure rate between MAT 1.2/1.3/1.4 and MAT 2.0.                                     | 1   | 0.054%               | 50%  | 50%  | 6.979% | 6.979% | PFL-0320113                                       |
| SPPL-057: Write IOEDC error due to  | Enable PROD_SID_FW_CLOCK_GATING flag to prevent a write IOEDC error.  | PROD_SID_FW_CLOCK_GATING flag enabled in AA6F00 F3 code   | 1   | 0.054%               | 100% | 100% | 6.952% | 6.952% | PFL-0623118                                       |
| SPPL-067: Bad PES at Quarter Track Position & VCAT Peak                       | OCUM changes to T109<br>Change servo flaw scan to map out areas as defects<br>Target code release ww  | Validating PFL 869 with test code EFDF in Korat.  | 1   | 0.054%               | 0%   | 90%  | 7.006% | 6.958% | PFL-06041636                                      |
| SPPL-069: Missed Defect - MAT 2.0   | Implement full Odd/Even in DFS. Implementation date ww44  |   | 1   | 0.054%               | 0%   | 80%  | 7.006% | 6.963% | PFL-0831154                                       |
| SPPL-070: Failed to Spare Error -   | Issue not repeatable in Reli or SIE. Pending fix  |   | 1   | 0.054%               | 0%   | 0%   | 7.006% | 7.006% | PFL-06671706                                      |
| SPPL-071: Head Instability - MAT 2.0  | DETCR Off in Runtime. Implementation in PCO 9.0   |   | 1   | 0.054%               | 0%   | 0%   | 7.006% | 7.006% | PFL-0822175                                       |
| SPPL-072: Offtrack Write due to insufficient ZEST correction near system area | Remove ZEST Taper near the system tracks.<br>#define TAPER_ZEST_NEAR_RESERVED_ZONE (1&& ENABLE_ZEST_DATA_OVERLAY) -> (0 && ENABLE_ZEST_DATA_OVERLAY)<br>#define TAPER_ZEST_NEAR_TRACK0 (1&& ENABLE_ZEST_DATA_OVERLAY) -> (0 && ENABLE_ZEST_DATA_OVERLAY)<br>Released Servo Code w |   | 1   | 0.054%               | 0%   | 90%  | 7.006% | 6.958% | PFL-08691229                                      |
| Single Bit Miscompare   | NANYA DDR - PART DQ'd   |   | 1   | 0.054%               | 0%   | 100% | 7.006% | 6.952% | PFL-10011420                                      |
| Weak Write  |   |   | 1   | 0.054%               | 0%   | 0%   | 7.006% | 7.006% | PFL-0303138                                       |
| Total Number of Fails   |   |   | 129 | Reduced AFR :        |      |      | 2.34%  | 1.43%  |   |
|   |   |   |     | Corresponding MTBF : |      |      | 101K   | 167K   |   |



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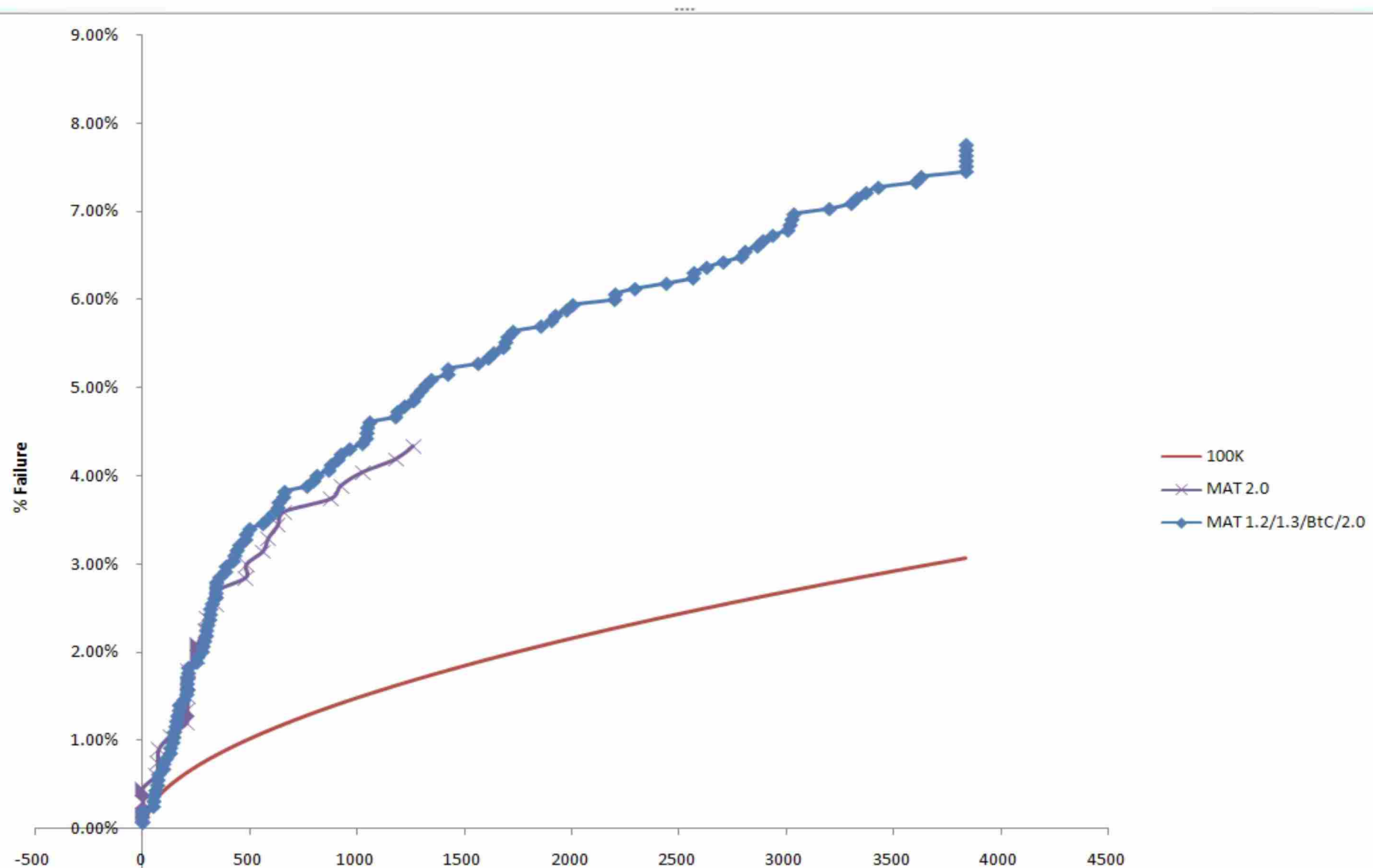


| MAT 2.0                  |         |   |             |                    |  | Updated: 4/27/11 12:00 AM |  |
|--------------------------|---------|---|-------------|--------------------|--|---------------------------|--|
| AFR (1st year Weibull)   | 5.005%  | From all fails Weibull MLE                        | 670         | Qty                |  |                           |  |
| MTBF (1st year Weibull)  | 46739.2 |   |             |                    |  |                           |  |
| Minimum AFR:             | 0.080%  | From zero fail Weibull @ 50% CL                   | 2400        | POH/Year           |  |                           |  |
| Total Number of Failures | 30      |   | 0.404653605 | Weibull Beta       |  |                           |  |
| AFR for 1 failure        | 0.164%  | AFR decrease per failure @ 100% fix effectiveness | 457         | Average Test Hours |  |                           |  |

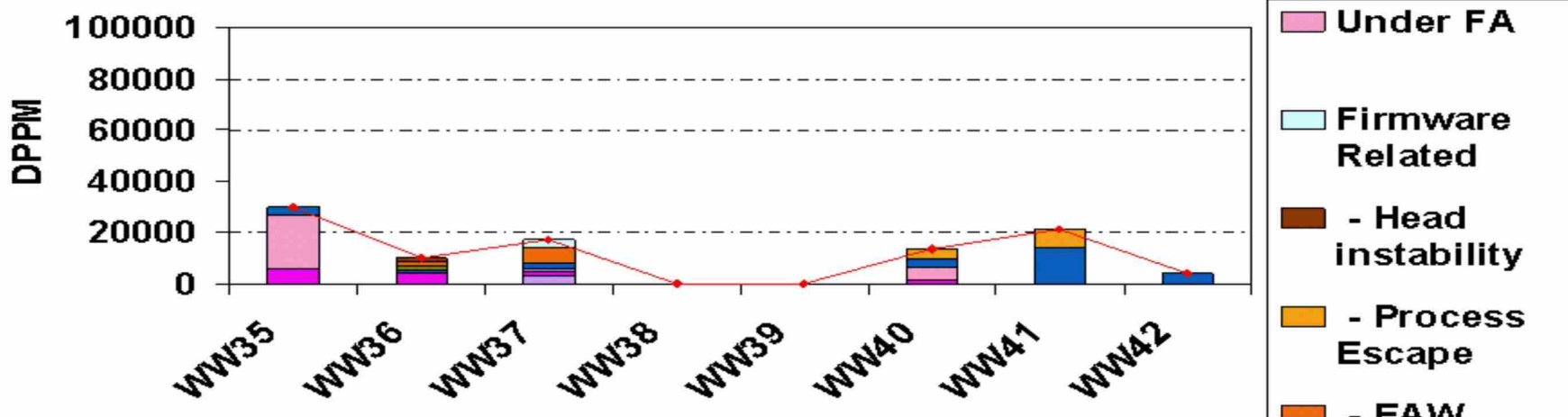
| Issue   | Corrective Action   | Fix Validation  | # of Failures | % Fail | Eff. Factors        |           | Reduced AFR |           | PFL/TTF   |
|---|---|---|---------------|--------|---------------------|-----------|-------------|-----------|---|
|   |   |   |               |        | Demo'd              | Potential | Demo'd      | Potential |   |
| SPPL-063: Encroachment due to ZEST/ATS  | ✕5C Servo Code to fix the bug: variable i32_SeekDestinationCylinderLogical which we use to decide if we are in the system area or not, is not getting updated by ATS seeks.   | Validation of 11 failures in Korat with new servo code. Additionally 400 drives loaded in LCO with new servo code. 0 Failures                                     | 12            | 1.970% | 100%                | 100%      | 3.035%      | 3.035%    | PFL-0846/90,PFL-0863/146,PFL-0826/89,PFL-0836/125,PFL-0824/56,PFL-0825/55,PFL-0823/56,PFL-0862/54,PFL-0855/78,PFL-0811/18,PFL-0864/171,PFL-0848/126 |
| SPPL-064: 20kHz Modulation - Suspension Sway Mode                             | Short Term: T180 Changes + Iris 4.5<br>Long Term: Iris 4.6 Change   | Failures in MAT 2.0 show 2kHz modulation in addition to the 20kHz. This has an affect on servo loop stability and is a contributing factor to the 20kHz failures. | 4             | 0.657% | 20%                 | 75%       | 4.874%      | 4.513%    | PFL-0885/153,PFL-0883/241,PFL-0818/20,PFL-0821/16   |
| SPPL-065: Weak Write due to Clearance Settling - MAT 2.0                      | Fix issue with PCO 8 disabling the weak write screen<br>VBAR by HMS Phase 3 implementation  | Validation with these 3 failures sent back to the process to re-run weak write screen   | 3             | 0.493% | 15%                 | 60%       | 4.931%      | 4.710%    | PFL-0812/0,PFL-0813/0,PFL-0805/0  |
| SPPL-068: SwDT - Iris 4.3 Suspensions   | Iris 4.5 Gold PZT   | All 20 SwDT failures in Grenada with Iris 4.3. Only 325 drives tested with Iris 4.5 to date.  | 2             | 0.328% | 72%                 | 80%       | 4.769%      | 4.743%    | PFL-0819/34,PFL-0827/67   |
| SPPL-073: EAW - MAT 2.0   | PCO 8.6 - In checkout in factory. Cut in date ww44.<br>(If DELTA_BER_CHUNK1 < 0.48 OR DELTA_BER_CHUNK3 < 0.3, then the Drive passes. Alternately, If DELTA_BER_CHUNK1 >= 0.48 AND DELTA_BER_CHUNK3 >= 0.3, then the Drive fails.  |   | 2             | 0.328% | 62%                 | 80%       | 4.802%      | 4.743%    | PFL-0925/307,PFL-0914/165   |
| SPPL-074: 47kHz Modulation - Gimble Yaw Mode - MAT 2.0                        | Short Term: DETCR Disabled in Runtime<br>Long Term: Iris 4.6 Chang  |   | 2             | 0.328% | 0%                  | 50%       | 5.005%      | 4.841%    | PFL-0884/267,PFL-0845/66  |
| IOEDC Error   | NANYA DDR - PART DQ'd   |   | 1             | 0.164% | 0%                  | 100%      | 5.005%      | 4.841%    | PFL-0940/329  |
| SPPL-069: Missed Defect - MAT 2.0   | Implement full Odd/Even in DFS. Implementation date ww44  |   | 1             | 0.164% | 0%                  | 80%       | 5.005%      | 4.874%    | PFL-0831/54   |
| SPPL-071: Head Instability - MAT 2.0  | DETCR Off in Runtime. Implementation in PCO 9.0   |   | 1             | 0.164% | 0%                  | 0%        | 5.005%      | 5.005%    | PFL-0822/75   |
| SPPL-072: Offtrack Write due to insufficient ZEST correction near system area | Remove ZEST Taper near the system tracks.<br>#define TAPER_ZEST_NEAR_RESERVED_ZONE (1 && ENABLE_ZEST_DATA_OVERLAY) -> (0 && ENABLE_ZEST_DATA_OVERLAY)<br>#define TAPER_ZEST_NEAR_TRACK0 (1 && ENABLE_ZEST_DATA_OVERLAY) -> (0 && ENABLE_ZEST_DATA_OVERLAY)<br>Released Servo Code w |   | 1             | 0.164% | 0%                  | 90%       | 5.005%      | 4.858%    | PFL-0869/229  |
| Single Bit Miscompare   | NANYA DDR - PART DQ'd   |   | 1             | 0.164% | 0%                  | 100%      | 5.005%      | 4.841%    | PFL-1001/420  |
| Total Number of Fails   |   |   | 30            |        | Reduced AFR:        |           | 2.39%       | 0.95%     |   |
|   |   |   |               |        | Corresponding MTBF: |           | 99K         | 251K      |   |





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## Korat Grenada ODT Performance WW1142



| Grenada                       | WW35  | WW36 | WW37  | WW38 | WW39    | WW40  | WW41  | WW42 |
|-------------------------------|-------|------|-------|------|---------|-------|-------|------|
| Q'ty Tested                   | 335   | 705  | 634   | 90   | 0       | 737   | 140   | 1179 |
| Q'ty Failed                   | 10    | 7    | 11    | 0    | 0       | 10    | 3     | 5    |
| DPPM                          | 29851 | 9929 | 17350 | 0    | #DIV/0! | 13569 | 21429 | 4241 |
| <b>HDD Related</b>            |       |      |       |      |         |       |       |      |
| - Skip write                  |       |      | 3155  |      |         |       |       |      |
| - NMD                         | 5970  | 4255 | 1577  |      |         | 1357  |       |      |
| - Abort write / Corrupt write |       |      | 1577  |      |         |       |       |      |
| - Offtrack write              |       |      |       |      |         |       |       |      |
| - Weak write                  | 20896 |      |       |      |         | 5427  |       |      |
| - Encroachment                | 2985  | 1418 | 1577  |      |         | 2714  | 14286 | 4241 |
| - Erasure                     |       | 1418 |       |      |         |       |       |      |
| - EAVV                        |       | 1418 | 6309  |      |         |       |       |      |
| - DNR                         |       |      |       |      |         |       |       |      |
| - Process Escape              |       |      |       |      |         | 4071  | 7143  |      |
| <b>Head Related</b>           |       |      |       |      |         |       |       |      |
| - Head Asym                   |       |      |       |      |         |       |       |      |
| - Head instability            |       | 1418 |       |      |         |       |       |      |
| <b>Firmware Related</b>       |       |      | 3155  |      |         |       |       |      |
| <b>Under FA</b>               |       |      |       |      |         |       |       |      |

WW 40-42 Combined DPPM Performance = 6809  
Excluding process escapes



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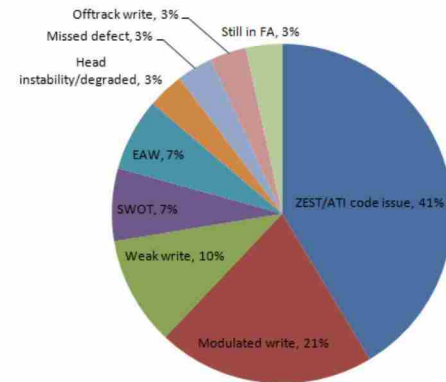
# Grenada Mat 2.0 Failure Pareto

WW43

## RDT / SBS

670 drives

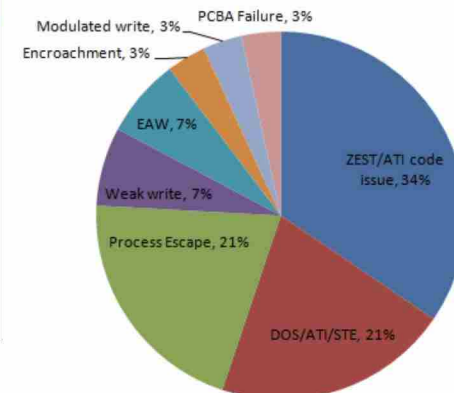
| Pareto                    |     | Total | Corrective Actions   | 3D |
|---------------------------|-----|-------|--|----|
| ZEST/ATI code issue       | 41% | 12    | Fix validated w/ xx5C servo code.                                    | 12 |
| Modulated write           | 21% | 6     | 2x modulation at 47khz. 4x modulation at ~20khz; Working on T180 CA. | 6  |
| Weak write                | 10% | 3     | Weak write at OD zones. (screen mistakenly disabled in IOS2. Fixed)  | 3  |
| SWOT                      | 7%  | 2     | First time we have SWOT on 6-hd. Suspect PZT, Iris 4.3 related.      | 2  |
| EAU                       | 7%  | 2     | Chunk spec passer. Working T234 spec; RHO for additional FA.         | 2  |
| Head instability/degraded | 3%  | 1     | More analysis in progress  | 1  |
| Missed defect             | 3%  | 1     | Developing DFS odd/even scans as CA.                                 | 1  |
| Offtrack write            | 3%  | 1     | Offtrack encroachment at head1, zone F.                              | 1  |
| Still in FA               | 3%  | 1     |  | 1  |
| Total                     |     | 29    |  | 29 |



## BODT

704 drives

| Pareto              |     | Total | Corrective Actions  | 3D |
|---------------------|-----|-------|---|----|
| ZEST/ATI code issue | 34% | 10    | Fix validated w/ xx5C servo code.                                       | 10 |
| DOS/ATI/STE         | 21% | 6     | Suspect BIE DOS setting issue w/ BtC. Detail analysis in progress.      | 6  |
| Process Escape      | 21% | 6     | 4x CST2 EC11049 timeouts; 2x CUT2 G-P merge / slip list issue. Fixed    | 6  |
| Weak write          | 7%  | 2     | Weak write at OD zones. (screen mistakenly disabled in IOS2. Fixed)     | 2  |
| EAU                 | 7%  | 2     | Chunk spec passer. Working T234 spec; RHO for additional FA.            | 2  |
| Encroachment        | 3%  | 1     | Odd head, OD zones. Suspect ZAP related.                                | 1  |
| Modulated write     | 3%  | 1     | Modulation at ~20khz. Working on T180 CA.                               | 1  |
| PCBA Failure        | 3%  | 1     | Bad LuxorL part, PLL2 timing issue. Working with LSI to resolve/screen. | 1  |
| Total               |     | 29    |   | 29 |



04/19/2011

## MAT 2.0

|                  | Qty Failures | % Validated FE |
|------------------|--------------|----------------|
| ZEST/ATS         | 10           | 90%            |
| ATI              | 6            | 75%            |
| Process Escape   | 6            | 100%           |
| Weak Write       | 2            | 0%             |
| Defective Luxor  | 1            | 0%             |
| 20kHz Modualtion | 1            | 0%             |

Total Failures 26  
Qty in Test 704

|                |       |
|----------------|-------|
| Raw DPPM       | 36932 |
| Projected DPPM | 9233  |

## Additional Loading in LCO with MAT 2.0 PCO

|                  | Qty Failures | % Validated FE |
|------------------|--------------|----------------|
| NMD              | 2            | 0%             |
| Skip Write       | 1            | 0%             |
| DNR              | 1            | 0%             |
| 20kHz Modualtion | 1            | 0%             |

Total Failures 5  
Qty in Test 400

|                |       |
|----------------|-------|
| Raw DPPM       | 12500 |
| Projected DPPM | 12500 |

- Zest/ ATS – Addressed in 5C servo code
- ATI – caught in GIO, PCO8.2 TPI warp improvement
- Process escape – G-P merge correct in PCO 8.4 and HGAs new spec, paper sort
- Weak write – MQM, 20% effective today, VBAR by HMS V3 target end of May
- Defective Luxor/ – Supplier FA, clocking issue, investigating screen
- 20kHz – T180 screen end of May
- DNR – follows HDA in FA
- Process mass pro drives augment with GIO, until < 8K DPPM





## MS1110A1R1

| FAMILY        | CAP  | WW 44  | WW 45  | WW 46  | WW 47  | May     | MBS     | Var      | WW 48  | WW 49  | WW 50  | WW 51  | WW 52  | June    | MBS     | Var    | Qtr4 FY11 | MBS     | Var     |
|---------------|------|--------|--------|--------|--------|---------|---------|----------|--------|--------|--------|--------|--------|---------|---------|--------|-----------|---------|---------|
| GRENADA       | 1000 | 8,000  | 9,000  | 17,000 | 26,200 | 60,200  | 60,200  | 0        | 6,000  | 9,000  | 10,000 | 11,000 | 13,833 | 49,833  | 50,055  | (222)  | 110,830   | 110,830 | 0       |
| GRENADA       | 2000 | 6,220  | 3,260  | 3,260  | 7,260  | 20,000  | 40,000  | (20,000) | 13,160 | 17,540 | 20,340 | 25,140 | 27,618 | 103,798 | 89,250  | 14,548 | 124,589   | 129,589 | (5,000) |
| GRENADA       | 3000 | 4,500  | 5,000  | 8,000  | 10,000 | 27,500  | 35,880  | (8,380)  | 6,680  | 8,680  | 9,800  | 12,920 | 14,420 | 52,500  | 44,120  | 8,380  | 79,995    | 79,995  | 0       |
| Total GRENADA |      | 18,720 | 17,260 | 28,260 | 43,460 | 107,700 | 136,080 | (28,380) | 25,840 | 35,220 | 40,140 | 49,060 | 55,871 | 206,131 | 183,425 | 22,706 | 315,414   | 320,414 | (5,000) |

|              |        |        |       |       |        |  |  |  |       |       |       |       |       |        |  |  |        |
|--------------|--------|--------|-------|-------|--------|--|--|--|-------|-------|-------|-------|-------|--------|--|--|--------|
| GiO Capacity | 18,720 | 17,260 | 9,000 | 7,000 | 51,980 |  |  |  | 7,000 | 7,000 | 7,000 | 7,000 | 7,000 | 35,000 |  |  | 86,980 |
| Percentage   | 100%   | 100%   | 32%   | 16%   | 48%    |  |  |  | 27%   | 20%   | 17%   | 14%   | 13%   | 17%    |  |  | 28%    |

- Factory team agrees to 100% ODT for the first two weeks and then measure performance and drop as appropriate with product performance capacity constraints and required metrics.





# SBS Qualification



Approval from SBS to ship Mass Pro; once the 100K MTBF is achieved. (Phil Rich & WenSan Lee-Morgan)

Rockit3.5 Desk: Driving the Q4 volume (Quanta)

- 1TB, 2TB & 3TB testing is complete: **Pass**
- LCO SBS SIE Target Mass Pro code: GR50. AM016V.CCD9 Complete: **Pass**

Rockit3.5 Home: Driving the Q4 volume (Quanta)

- 1TB, 2TB & 3TB testing is complete: **Pass**
- LCO SBS SIE Target Mass Pro code: GR50. AM016V.CCD9 Complete: **Pass**

Bronson: New SBS product Estimated RTS: July 2011 (GoFlex) not driving Q4 volume (CalComp)

- CTUs shipped: 63 3TBs, 20 2TBs, 20 1TBs
  - EVT build complete; no drive issues, working through enclosure FW issues
  - DVT starts 14 May





# SBS Approval for Z-Height

John,

As you said on our conversation the Z height over at 0.0045" should be OK with SBS 3.5" enclosure. If this is for short run / low volume I'm OK to ship them

Regards,

Cuong/

Cuong Tran

Sr Staff Hardware Engineer

Product Development

Seagate Technology Retail Group

On Tue, Apr 26, 2011 at 3:30 PM, John Mortellaro <john.mortellaro@seagate.com> wrote:

Hi Cuong,

This will be for the production volume through May. I will provide an update if it will be any longer than that.

Thanks,

John

Hi WenSan.

Can you review and let us know if we can get approval for the height out of spec condition for the early volume shipments? We meet with the SMT at 1:30pm our time sorry for the late notice reli just came to us this morning with the issue and we are going for SBS SAD today and this is an open item.

Bogart- 1.022 - 1.024"

Grenada - 1.027 - 1.032"

Z-height Spec: 1.0276"

Grenada over spec 0.0045"

We will figure out what is causing the issue and resolve it, but for the early volume is this acceptable?

It appears to be cover bow, but base casting may be contributing too.



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## Grenada Test Plan In Rocket

| Test                      | Start    |        | Time Needed<br>Per Config | Finish   |        | Number of<br>Drives Per Config | Notes   |
|---------------------------|----------|--------|---------------------------|----------|--------|--------------------------------|---|
|                           | Expected | Actual |                           | Expected | Actual |                                |   |
| Mechanical                |          |        |                           |          |        |                                |   |
| Acoustics USB 2.0 Speed   | 14-Feb   | 12-Feb | 24hrs                     | 15-Feb   | 12-Feb | 2                              | USB 2.0 only  |
| Thermal Limit             | 16-Feb   | 14-Feb | 24hrs                     | 17-Feb   | 16-Mar | 2                              |   |
| 2" Op-Flat Drop           | 16-Feb   | 15-Feb | 24hrs                     | 17-Feb   | 16-Feb | 2                              |   |
| Op Topple                 | 18-Feb   | 16-Feb | 24hrs                     | 18-Feb   | 17-Feb | 2                              |   |
| 12" Non-Op Drop           | 21-Feb   | 17-Feb | 24hrs                     | 22-Feb   | 22-Feb | 2                              |   |
| Electrical                |          |        |                           |          |        |                                |   |
| DC Power Margining Test   | 14-Feb   | 15-Feb | 24hrs                     | 16-Feb   | 15-Feb | 2                              |   |
| PWR Loss Recovery         | 18-Feb   | 15-Feb | 24hrs                     | 19-Feb   | 15-Feb | 2                              |   |
| DC Power Consumption      | 16-Feb   | 14-Feb | 24hrs                     | 17-Feb   | 23-Mar | 2                              |   |
| PWR Cycle Test            | 22-Feb   | 15-Feb | 120hrs                    | 27-Feb   | 25-Mar | 2                              | Issue in test due to SBS Bridge Board                 |
| Environmental             |          |        |                           |          |        |                                |   |
| Non-Op Thermal Cycle Test | 15-Feb   | 15-Feb | 96hrs                     | 22-Feb   | 22-Feb | 2                              |   |
| Op Thermal-Cycle Test     | 15-Feb   | 15-Feb | 96hrs                     | 22-Feb   | 22-Feb | 2                              |   |
| EMC /Agency               |          |        |                           |          |        |                                |   |
| Radiated Emissions (3-m)  | 18-Feb   | 22-Mar | 96hrs                     | 23-Feb   | 28-Mar | 2                              | USB 2.0 only, bare drive que is holding up testing    |
| Radiated Emissions (10-m) | N/P      | N/P    | 24hrs                     | N/P      | N/P    | 1                              |   |
| On-ESD                    | 29-Mar   | 29-Mar | 24hrs                     | 1-Apr    | 1-Apr  | 2                              | USB 2.0 only Start Date dependent on completion of RE |
| Data-Integrity Test       |          |        |                           |          |        |                                |   |
| Mayhem Real World 2       | 27-Feb   | 27-Feb | 240hrs                    | 11-Mar   | 11-Mar | ~10                            | Restarting DIT with 30 drives, all USB 3.0            |
|                           |          |        |                           |          |        |                                |   |
| Legend                    |          |        |                           |          |        |                                |   |
| Target Start Date         |          |        |                           |          |        |                                |   |
| In Process                |          |        |                           |          |        |                                |   |
| Test Completed/Passed     |          |        |                           |          |        |                                |   |
| Problem/Test Failed       |          |        |                           |          |        |                                |   |
| N/P: Not Planned          |          |        |                           |          |        |                                |   |



| Grenada Test Plan In Raptor USB 2.0 |          |        |                           |          |        |                                |   |
|-------------------------------------|----------|--------|---------------------------|----------|--------|--------------------------------|---|
| Test                                | Start    |        | Time Needed<br>Per Config | Finish   |        | Number of<br>Drives Per Config | Notes                                     |
|                                     | Expected | Actual |                           | Expected | Actual |                                |   |
| Mechanical                          |          |        |                           |          |        |                                |   |
| Acoustics                           | 5-Apr    | 5-Apr  | 24hrs                     | 6-Apr    | 5-Apr  | 2                              |   |
| Thermal Limit                       | 6-Apr    | 6-Apr  | 24hrs                     | 7-Apr    | 8-Apr  | 2                              | 11C Over Limit                            |
| 2" Op-Flat Drop                     | 11-Apr   | 11-Apr | 24hrs                     | 12-Apr   | 13-Apr | 2                              | 2 Failures. Both hard errors. In FA       |
| 12" Non-Op Drop                     | 18-Apr   | 13-Apr | 24hrs                     | 20-Apr   |        | 2                              |   |
| Electrical                          |          |        |                           |          |        |                                |   |
| DC Power Margining Test             | 4-Apr    | 4-Apr  | 24hrs                     | 5-Apr    | 5-Apr  | 2                              |   |
| DC Power Consumption                | 6-Apr    | 5-Apr  | 24hrs                     | 8-Apr    | 5-Apr  | 2                              |   |
| PWR Cycle Test                      | 15-Apr   | 6-Apr  | 120hrs                    | 22-Apr   |        | 2                              |   |
| Environmental                       |          |        |                           |          |        |                                |   |
| Non-Op Thermal Cycle Test           | 28-Mar   | 26-Mar | 96hrs                     | 4-Apr    | 4-Apr  | 2                              |   |
| Op Thermal-Cycle Test               | 6-Apr    | 7-Apr  | 96hrs                     | 14-Apr   |        | 2                              |   |
| EMC /Agency                         |          |        |                           |          |        |                                |   |
| Radiated Emissions (3-m)            | 22-Apr   |        | 96hrs                     | 29-Apr   |        | 2                              |   |
| Radiated Emissions (10-m)           | N/P      | N/P    | 24hrs                     | N/P      | N/P    | 1                              |   |
| Op-ESD<br>USB 2.0 only              | TBD      | TBD    | 24hrs                     | TBD      | TBD    | 2                              | Dates determined by RE Testing completion |
| Data-Integrity Test                 |          |        |                           |          |        |                                |   |
| Mayhem Real World 2                 | 8-Apr    |        | 240hrs                    | 15-Apr   |        | ~10                            |   |

|                       |
|-----------------------|
| Legend                |
| Target Start Date     |
| In Process            |
| Test Completed/Passed |
| Problem/Test Failed   |
| N/P: Not Planned      |

**RAPTOR TESTING NOT COMPLETE**  
**RAPTOR not driving May volume**



## Key Actions:

- **20/47KHz Modulation Failures**

- PCO 8.0 and greater for clearance detect updates (Done)
- Implement Iris 4.5 gold contact suspension (Done)
- SWD clearance adjust feature and disabling DETCR bias after serial format (PCO 9.0 ~May 30)
- MD clearance hump if required (PCO 9.0 ~May 30 if required)
- Suspension tweak (DOE in progress date TBD)

- **Degraded Reader**

- SWD clearance adjust feature (PCO 9.0 ~May 30)
- Increased TA padding (PCO 9.0 ~May 30)
- Possibly HMRB9.8 (late 2011)

- **EAW**

- EAW screen with PCO 8.6 Test 234 limits (Done)
- Anneal process change from RHO (cut in at wafer, HGA flow to HSA and mass production May)

- **Z Height dimension failures from 3D**

- Closed with SBS, dimension delta is not applicable to their mounting scheme, no problem for SBS. (Done)
- Engineering in progress of analyzing failing configurations and will recommend CA (April 29)

- **Single-Bit Miscompare/IOEDC error with Nanya DDR**

- Removed from build configuration pending root cause and CA (Done)
- Root cause FA in progress (May 21)

- **Raptor SBS enclosure failures for temperature and drop test**

- Not included in this release! (Targeted for June after CA, FA in progress)





# SBS Mass Pro Configuration



# Grenada SBS Material Configuration

Case 3:16-cv-00523-JCS Document 151-1 Filed 01/05/18 Page 24 of 55

- Capacity: 1TB, 2TB, 3TB
- Part Numbers: 9YN162, 9YN164, 9YN166-568
- FW: GR50.CCD9. AM016V.CC93,xx5C
- PCO: GRN-008.6 or greater. **It is acceptable to screen drives tested with PCO8.3/8.4 but we must include the G to P merge screen and the Test 234 EAW specs of PCO8.6 to ship product certed with PCO 8.3/8.4**
- Screens: MQM
- Factory: Korat

## Key Material:

- Head Design: RHO BP4 or greater / MPT Iris 4.5, **Iris 4.3 can be used as long as 100% GIO test**
- Media: RMO G5
- Motors: Nidec, Alphana
- PreAmps: LSI only; until TI qualification WW48
- Power ASIC: McKinley XL: ST and TI
- DDRs: Winbond, Samsung, Hynix
- SOC: Luxor2.1 LSI

## BOM Exclusions – Not included in Gen Test Beds

- Depops, until RDT1 qualification
- TI PreAmp pending qualification in RDT1
- Fuji Media pending qualification in RDT1
- TDK Head pending qualification, target TBD
- **NHK suspension**



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| MS1110A2 |       | W44    | W45   | W46   | W47    | W48    | W49    | W50    | W51    | W52     | Q4'11   |
|----------|-------|--------|-------|-------|--------|--------|--------|--------|--------|---------|---------|
| Demand   | 1TB   | 9000   | 9000  | 15000 | 27200  | 6000   | 9000   | 10000  | 11000  | 13828   | 110028  |
|          | 2TB   | 5220   | 4260  | 4260  | 6260   | 13160  | 17540  | 20340  | 25140  | 27618   | 123798  |
|          | 3TB   | 4500   | 5000  | 8000  | 10000  | 6680   | 8680   | 9800   | 12920  | 14420   | 80000   |
|          | Total | 18720  | 18260 | 27260 | 43460  | 25840  | 35220  | 40140  | 49060  | 55866   | 313826  |
| Outlook  | 1TB   | 6400   | 10119 | 15450 | 26320  | 5806   | 8709   | 9676   | 10644  | 13381   | 106505  |
|          | 2TB   | 1700   | 4487  | 4839  | 4741   | 10261  | 13604  | 15707  | 19349  | 21243   | 95930   |
|          | 3TB   | 2000   | 4189  | 8547  | 7224   | 4826   | 6270   | 7079   | 9333   | 10417   | 59886   |
|          | Total | 10100  | 18795 | 28836 | 38285  | 20892  | 28583  | 32463  | 39327  | 45040   | 262321  |
| Delta    | 1TB   | (2600) | 1119  | 450   | (880)  | (194)  | (291)  | (324)  | (356)  | (447)   | (3523)  |
|          | 2TB   | (3520) | 227   | 579   | (1519) | (2899) | (3936) | (4633) | (5791) | (6375)  | (27868) |
|          | 3TB   | (2500) | (811) | 547   | (2776) | (1854) | (2410) | (2721) | (3587) | (4003)  | (20114) |
|          | Total | (8620) | 535   | 1576  | (5175) | (4948) | (6637) | (7677) | (9733) | (10826) | (51505) |

- Outlook based on 1% lower yield per head ; 2%-1TB , 4-6%-2TB and 6%-3TB.
- Need actual yield demo on PCO 8.6.
- LCO has requested Factory to bias output reductions to the 3TB for Q4. Per discussion with Thanit this will be aligned from WW47 onwards.





# ***Grenada SIE SBS Test Status***

04/21/2011



**Cumulative SIE Test hours – 570,076**

**Cumulative SIE SBS Test hours (GR50) – 26,373**

## **GR50.CCD9.AM016V Test Summary:**

Drives tested: 41

Test hours: 72

Failed: 0

## **Grenada Current Open Issues – DISTY / OEM Gates:**

- SDD-0152854 Flash Led BD@8611 (Possible issue for SBS).
- SDD-0146961 Security Normal and Enhanced Erase aborting when it is expected to execute.
- SDD-0148913 CE Log Event Type incorrect for BGMS Entry
- RDD-0154887 CCTO Due to Write Retries Due to Bad Servo



# Yields/Test Time



**EAW Improvement Plan:**

- Current EAW spec is required for attaining and sustaining SBS SAD. Yield fallout is ~ 1% on a head-level basis.
- Improvement in 3 areas:
  - Head Design Improvements:
    - Wafers with SCOCA are already beginning to hit mass-pro. Should show an improvement in EAW performance.
    - Further wafer design improvements being worked with RHO (longer-term) through root cause FA.
  - System-Level Improvements:
    - Working with SE team to identify sensitivities to known KPIV's for EAW.
    - Expectation is to have a PCO delivered with system-level improvements to factory in 2 weeks time (target – FW45).
  - Screening Improvements:
    - Once EAW levels have been brought down with SCOCA wafers and System-level improvements, transition to P240 and associated specs and eliminate P234.

**BtC Yield Improvement Plan:**

- Current 2TB BtC drive yield (6-headers using S5) is ~ 40%.
- Major fallout areas:
  - Contact Detect – EC14841, EC14703 etc. accounts for ~ 10% (common with 3TB).
  - VBAR-related – EC13409, EC13406 etc. accounts for ~ 15%.
  - Flawscan-related – EC10532 etc. accounts for ~ 3%.
  - Weak-Write Screen – EC14180 accounts for ~ 6%.
  - Heater-Resistance Screen – EC12964 accounts for ~ 1% (common with 3TB).
- Improvements:
  - VBAR-related, Flawscan-related, Weak-Write related fallout have all been addressed with ET S5 spec change – cut in as of 4/25. Recovery rate ~ 75 – 80%.
  - Heater Resistance Issue – resolved in PCO 8.6.
  - Contact Detect Issues – Partially will be resolved in next PCO (detector selection change), partially need to drive ET spec change for instability screening (FA and data mining in progress).



# Test Time Reduction Status

## • Serial Port (2 head)

|             | Current | Target | 7/1/11 | 8/1/11 |
|-------------|---------|--------|--------|--------|
| PRE2        | 4.5     | 4.1    | 4.5    | 3.8    |
| CAL2        | 6.2     | 4.2    | 5.2    | 4.1    |
| FNC2        | 34.4    | 27.7   | 29.1   | 28.2   |
| Serial Port | 45.1    | 36.0   | 38.7   | 36.1   |

### Serial Port Test Time Reduction Plans (Gen2B w/o T234)

7/1/11

ZAP (CAL2) – 63.5 minutes (remove test – ZEST)

READ\_SCRN – 27.5 minutes (T199 – timeout issue)

SERIAL\_FMT – 231.7 minute reduction (remove test – DFS)

Serial Format and DFS are running in parallel until equivalency.

RE\_FORMAT – 62.6 minute (remove test – DFS)

8/1/11

BODEx – 47.1 minutes (remove test)

SVO\_SCRN – 12.6 minutes (remove tests)

AFHx – 36.5 minutes (T135 Optimization)

HIRP – 10.1 minutes (T191 Optimization)

| Serial Port Description      | Minutes |       |        |       | Hours |     |        |      |
|------------------------------|---------|-------|--------|-------|-------|-----|--------|------|
|                              | 2H      | 4H    | 6H BTC | 6H    | 2H    | 4H  | 6H BTC | 6H   |
| <b>GEN2C</b>                 |         |       |        |       |       |     |        |      |
| ZAP (CAL2) Remove test-ZEST  | 63.5    | 127   | 171.45 | 190.5 | 1.1   | 2.1 | 2.9    | 3.2  |
| READ_SCRN T199 Timeout Issue | 27.5    | 55    | 74.25  | 82.5  | 0.5   | 0.9 | 1.2    | 1.4  |
| SERIAL_FMT Remove test - DFS | 231.7   | 463.4 | 625.59 | 695.1 | 3.9   | 7.7 | 10.4   | 11.6 |
| RE-FORMAT Remove test - DFS  | 62.6    | 125.2 | 169.02 | 187.8 | 1.0   | 2.1 | 2.8    | 3.1  |
|                              |         |       |        |       |       |     |        |      |
| <b>SAD</b>                   |         |       |        |       |       |     |        |      |
| BODEx Remove Test            | 47.1    | 94.2  | 127.17 | 141.3 | 0.8   | 1.6 | 2.1    | 2.4  |
| SVO_SCRN Remove tests        | 12.6    | 25.2  | 34.02  | 37.8  | 0.2   | 0.4 | 0.6    | 0.6  |
| AFHx T135 Optimization       | 36.5    | 73    | 98.55  | 109.5 | 0.6   | 1.2 | 1.6    | 1.8  |
| HIRP T191 Optimization       | 10.1    | 20.2  | 27.27  | 30.3  | 0.2   | 0.3 | 0.5    | 0.5  |
|                              |         |       |        |       |       |     |        |      |



# Test Time Reduction Status

- **I/O (2 head)** – Does not include IOSC2

|      | Current | Target | 7/1/11 | 8/1/11 |
|------|---------|--------|--------|--------|
| CRT2 | 0.6     | 1.0    | 0.6    | 0.4    |
| FIN2 | 0.8     | 0.2    | 0.8    | 0.4    |
| CUT2 | 0.7     | 0.3    | 0.7    | 0.7    |
| I/O  | 2.1     | 1.5    | 2.1    | 1.5    |

- **I/O Test Time Plans**
  - 7/1/11
    - No Actions
  - 8/1/11
    - AFHx – 8.4 minutes (T135 Optimization)
    - AFH\_CLEANUP – 1.7 minutes (Replaced by AFH1 T109 cleanup)
    - Remove Performance Tests – replaced by DFS missed revs data

NOTE: Need to add T597 / T598 to FIN2 and add test time.





# YIP and Test Times LRP 40-06

| Composite Prime Yield |                       |       |          |                         |                          |                          |                           |                           |                           | Composite Insertion Yield   |                              |                              |                               |                               |                               |
|-----------------------|-----------------------|-------|----------|-------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|-----------------------------|------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|
| SAD                   | Detailed Product Name | Heads | Capacity | Prime Yield (SAD +1 Mo) | Prime Yield (SAD +4 Mos) | Prime Yield (SAD +7 Mos) | Prime Yield (SAD +10 Mos) | Prime Yield (SAD +13 Mos) | Prime Yield (SAD +16 Mos) | Insertion Yield (SAD +1 Mo) | Insertion Yield (SAD +4 Mos) | Insertion Yield (SAD +7 Mos) | Insertion Yield (SAD +10 Mos) | Insertion Yield (SAD +13 Mos) | Insertion Yield (SAD +16 Mos) |
| 11-Mar-2011           | Grenada               | 6     | 3,000    | 43.1%                   | 51.0%                    | 54.0%                    | 56.0%                     | 58.0%                     | 59.0%                     | 28.1%                       | 36.0%                        | 44.0%                        | 46.0%                         | 48.0%                         | 49.0%                         |
| 11-Mar-2011           | Grenada               | 4     | 2,000    | 54.1%                   | 61.0%                    | 69.0%                    | 71.0%                     | 74.0%                     | 75.5%                     | 44.1%                       | 51.0%                        | 59.0%                        | 63.0%                         | 66.0%                         | 67.5%                         |
| 11-Mar-2011           | Grenada               | 2     | 1,000    | 72.0%                   | 76.8%                    | 82.0%                    | 84.0%                     | 85.9%                     | 86.0%                     | 64.0%                       | 68.8%                        | 76.0%                        | 78.0%                         | 79.9%                         | 82.0%                         |

|               |             |                       |       |          |         |             | Composite Test Time   |                        |                        |                         |                         |                         |
|---------------|-------------|-----------------------|-------|----------|---------|-------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|
| Design Center | SAD         | Detailed Product Name | Heads | Capacity | Process | Form Factor | Test Time (SAD +1 Mo) | Test Time (SAD +4 Mos) | Test Time (SAD +7 Mos) | Test Time (SAD +10 Mos) | Test Time (SAD +13 Mos) | Test Time (SAD +16 Mos) |
| LCO           | 11-Mar-2011 | Grenada               | 6     | 3,000    | Gemini  | 3.5         | 120.0                 | 107.9                  | 102.8                  | 102.8                   | 102.8                   | 102.8                   |
| LCO           | 11-Mar-2011 | Grenada               | 6     | 2,500    | Gemini  | 3.5         | 112.0                 | 100.8                  | 96.0                   | 96.0                    | 96.0                    | 96.0                    |
| LCO           | 11-Mar-2011 | Grenada               | 6     | 2,000    | Gemini  | 3.5         | 103.3                 | 92.9                   | 88.5                   | 88.5                    | 88.5                    | 88.5                    |
| LCO           | 11-Mar-2011 | Grenada               | 5     | 2,500    | Gemini  | 3.5         | 100.9                 | 90.8                   | 86.5                   | 86.5                    | 86.5                    | 86.5                    |
| LCO           | 11-Mar-2011 | Grenada               | 5     | 2,000    | Gemini  | 3.5         | 92.9                  | 83.6                   | 79.6                   | 79.6                    | 79.6                    | 79.6                    |
| LCO           | 11-Mar-2011 | Grenada               | 4     | 2,000    | Gemini  | 3.5         | 81.8                  | 73.6                   | 70.1                   | 70.1                    | 70.1                    | 70.1                    |
| LCO           | 11-Mar-2011 | Grenada               | 4     | 1,500    | Gemini  | 3.5         | 81.8                  | 73.6                   | 70.1                   | 70.1                    | 70.1                    | 70.1                    |
| LCO           | 11-Mar-2011 | Grenada               | 3     | 1,500    | Gemini  | 3.5         | 62.7                  | 56.4                   | 53.7                   | 53.7                    | 53.7                    | 53.7                    |
| LCO           | 11-Mar-2011 | Grenada               | 2     | 1,000    | Gemini  | 3.5         | 43.4                  | 39.1                   | 37.2                   | 37.2                    | 37.2                    | 37.2                    |
| LCO           | 11-Mar-2011 | Grenada               | 2     | 750      | Gemini  | 3.5         | 39.3                  | 35.4                   | 33.7                   | 33.7                    | 33.7                    | 33.7                    |



# PCO 8.2/8.3 Yield Demo

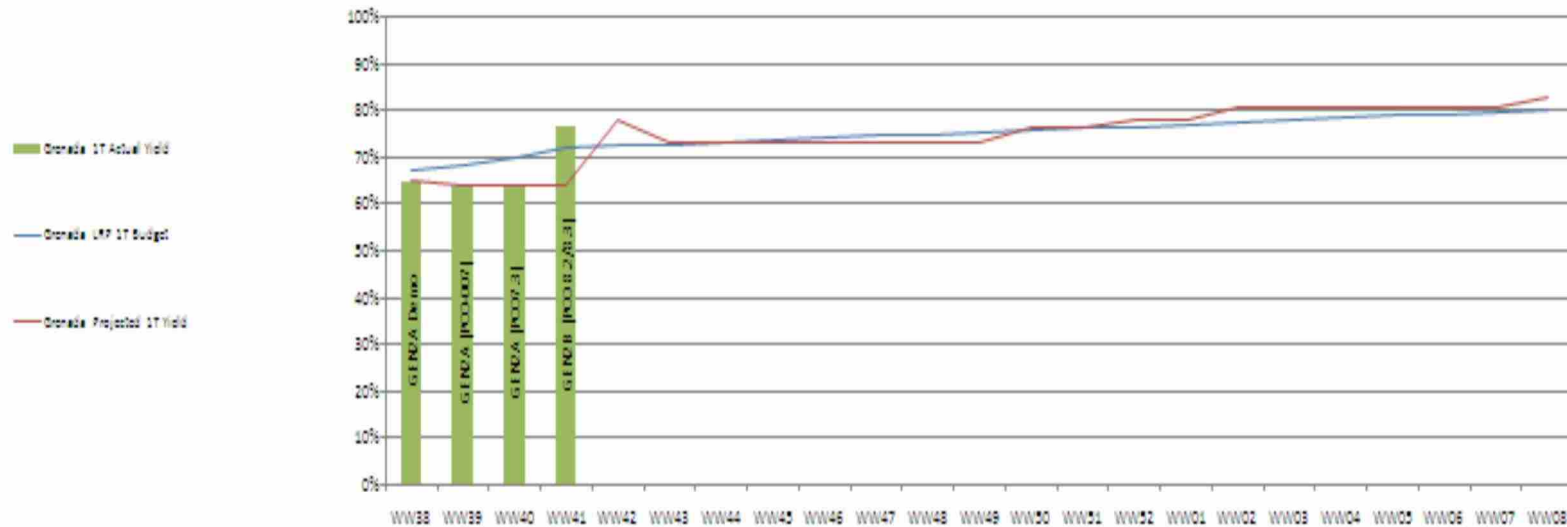
## PCO GRN-008.2/8.3

- Drives ran PRE2-FNC2 with 8.2 (ATI mitigation & 3D WTF niblets)
- Drives were intercepted in I/O with 8.3 to ensure they run Weak Write Screen (IOSC2)

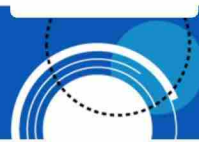
|    | Start Qty | Capacity    | PRE2 | CAL2 | FNC2 | CRT2 | FIN2  | IOSC2 | CUT2  | Composite Yield |
|----|-----------|-------------|------|------|------|------|-------|-------|-------|-----------------|
| 1D | 965       | 1TB         | 90.7 | 94.5 | 94.1 | 97.7 | 99.6  | 97.9  | 100.0 | 76.8            |
| 2D | 696       | Combined    | 94.7 | 94.0 | 93.1 | 94.9 | 99.1  | 87.4  | 99.6  | 67.8            |
|    |           | 2TB (618)   |      | 94.5 | 93.8 | 95.4 | 99.1  | 92.6  | 99.6  | 73.2            |
|    |           | 1.5TB (48)  |      | 87.5 | 83.7 | 88.6 | 100.0 | 0*    |       |                 |
| 3D | 994       | 3TB (540)   | 84.6 | 85.7 | 88.0 | 93.8 | 99.8  | 95.0  | 99.8  | 56.6            |
|    |           | 2.5TB (237) |      | 97.8 | 92.0 | 95.4 | 99.1  | 0*    |       |                 |

\* 0% yield is due to a process issue: depop support requires a plugin for WTF capacities. These drives can be recovered. Fix is in PCO 8.5.

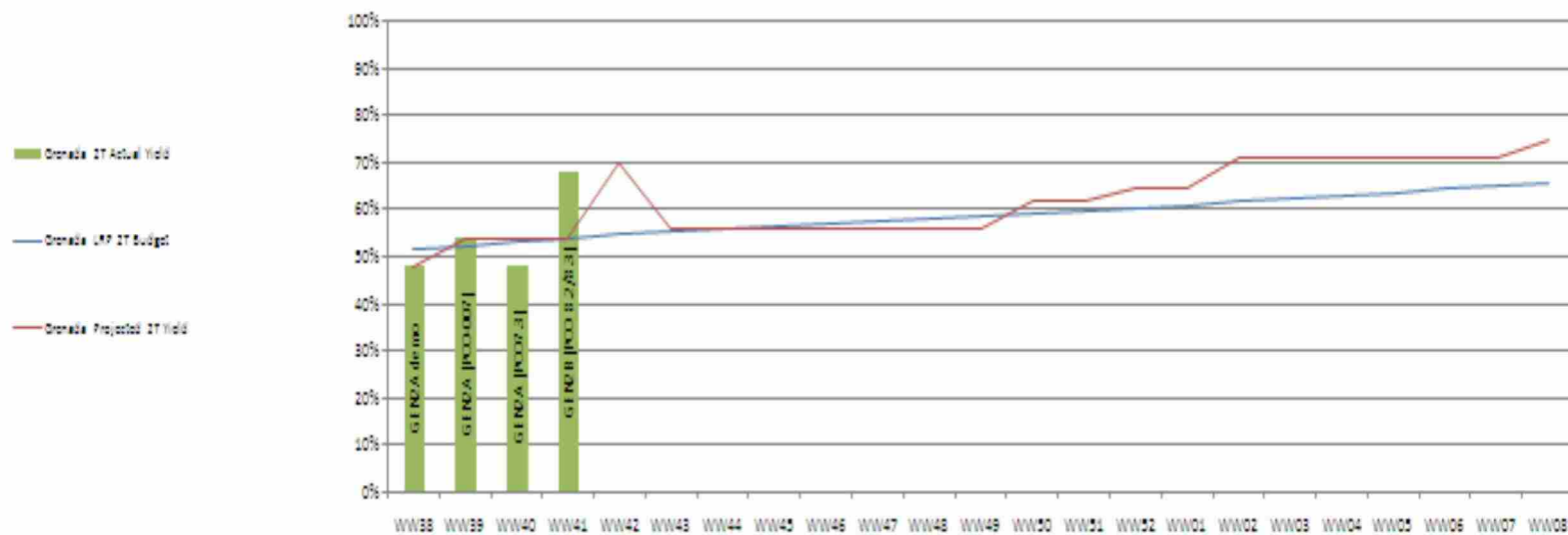




| Grenada 1T Yield Improvement Plan                           | Improvement | Fallout | When  | WW38  | WW39  | WW40  | WW41  | WW42  | WW43  | WW44  | WW45  | WW46  | WW47  | WW48  | WW49  | WW50  | WW51  | WW52  | WW01  | WW02  | WW03  | WW04  | WW05  | WW06  | WW07  | WW08  |
|---|-------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| EC 14841; AFH 35.1+ improvements (new AFH version)          | 0.8%        | 2.2%    | W/W42 |       |       |       |       | 0.80% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| C 42177, 42176, 14994; ZEST improvements (ZEST 4.0 release) | 1.2%        | 2.4%    | W/W43 |       |       |       |       |       | 1.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10482; T50/T51 to run in LBA mode (SF3)                  | 0.35%       | 0.71%   | W/W43 |       |       |       |       |       | 0.35% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10446; DFS padding improvements (DFS 6.6 release)        | 0.3%        | 0.6%    | W/W43 |       |       |       |       |       | 0.30% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10468; T240 EAW test setup improvements (SF3)            | 0.1%        | 0.2%    | W/W43 |       |       |       |       |       | 0.10% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EAW Spec  | -4%         |         | W/W43 |       |       |       |       |       | -3%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| ATH/STE Spec  | -4%         |         | W/W43 |       |       |       |       |       | -4%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Stability Spec  | -1%         |         | W/W43 |       |       |       |       |       | -1%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Wafer EAW Improvement I (MNR)                               | 1.5%        |         | W/W43 |       |       |       |       |       | 1.5%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Wafer EAW Improvement II (VP4.1)                            | 1.5%        |         | W/W52 |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.5%  |       |       |       |       |       |       |       |       |
| G6B Media Transition/Fuji FG3.2                             | 3%          |         | W/W02 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3%    |       |       |       |       |       |       |
| BP84.5 (BP85 Writer on BP84 Reader) heads                   | 3%          |         | W/W50 |       |       |       |       |       |       |       |       |       |       |       |       | 3%    |       |       |       |       |       |       |       |       |       |       |
| BP85.5 heads  | 2%          |         | W/W08 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2%    |
|   |             |         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Total YIP   |             |         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Grenada 1T Actual Yield                                     |             |         |       | 65%   | 64%   | 64%   | 76.8% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LRP Grenada 1T Budget                                       |             |         |       | 67.4% | 68.6% | 69.8% | 72.0% | 72.4% | 72.8% | 73.2% | 73.6% | 74.0% | 74.4% | 74.8% | 75.2% | 75.6% | 76.0% | 76.4% | 76.8% | 77.2% | 77.7% | 78.1% | 78.5% | 79.0% | 79.4% | 79.8% |
| Grenada 1T Projected Yield                                  |             |         |       | 65%   | 64%   | 64%   | 64%   | 78%   | 73%   | 73%   | 73%   | 73%   | 73%   | 73%   | 73%   | 76%   | 76%   | 78%   | 78%   | 81%   | 81%   | 81%   | 81%   | 81%   | 81%   | 83%   |



## Grenada – YIP 2TB



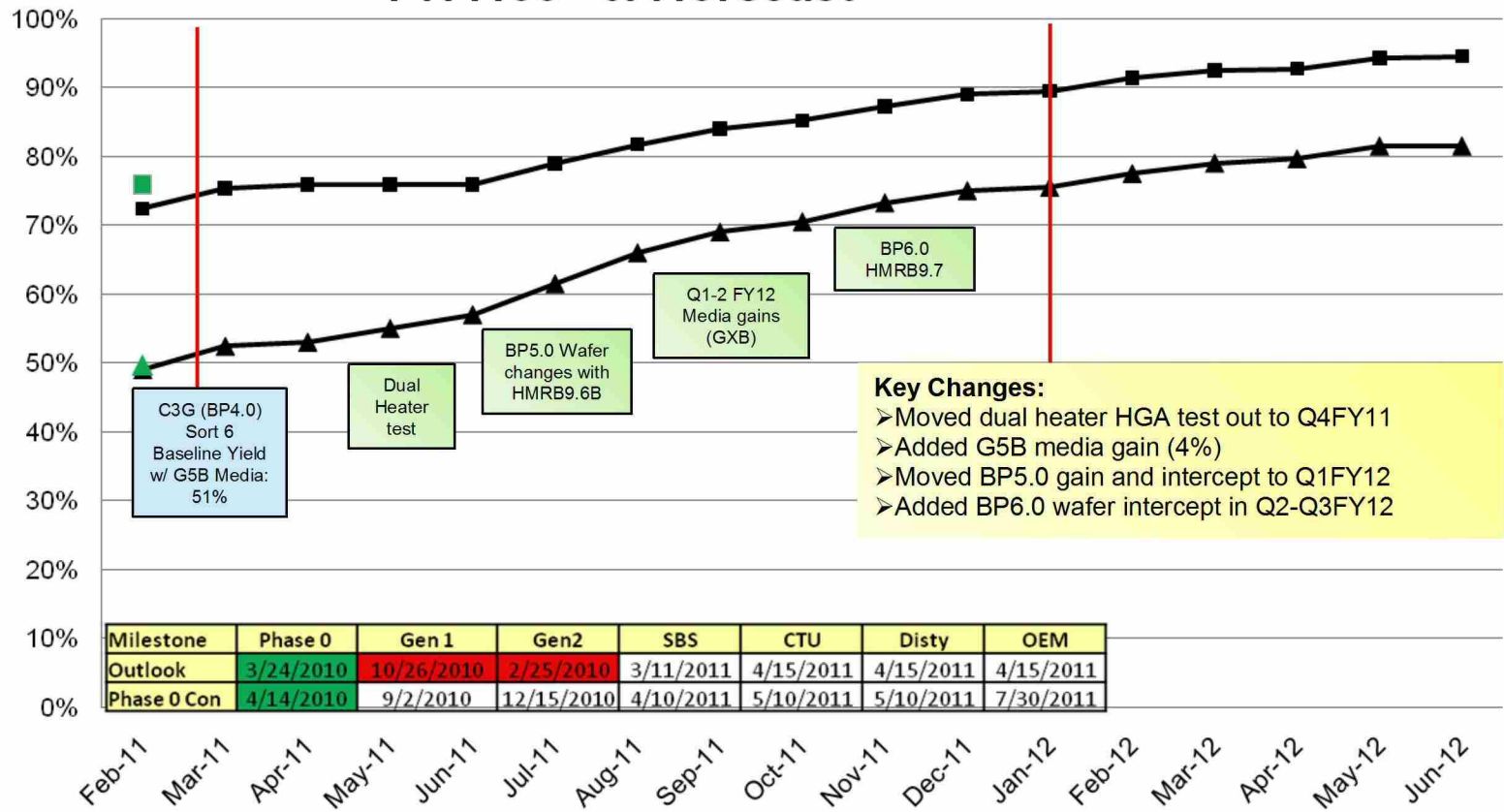
| Grenada 2T Yield Improvement Plan                           | Improvement | Fallout | When  | WW38  | WW39  | WW40  | WW41  | WW42  | WW43  | WW44  | WW45  | WW46  | WW47  | WW48  | WW49  | WW50  | WW51  | WW52  | WW01  | WW02  | WW03  | WW04  | WW05  | WW06  | WW07  | WW08  |
|---|-------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| EC 14841; AFH 35.1+ improvements (new AFH version)          | 2%          | 4.5%    | W/W42 |       |       |       |       | 2%    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| C 42177, 42176, 14394; ZEST improvements (ZEST 4.0 release) | 0.15%       | 0.3%    | W/W43 |       |       |       |       |       | 0.15% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10482; T50/T51 to run in LBA mode (SF3)                  | 1.12%       | 0.6%    | W/W43 |       |       |       |       |       | 0.6%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10446; DFS padding improvements (DFS 6.6 release)        | 0.1%        | 0.2%    | W/W43 |       |       |       |       |       | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10468; T240 EAW test setup improvements (SF3)            | 0.1%        | 0.20%   | W/W43 |       |       |       |       |       | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EAW Spec  | -8%         |         | W/W43 |       |       |       |       |       | -8%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| ATH/STE Spec  | -8%         |         | W/W43 |       |       |       |       |       | -8%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Stability Spec  | -2%         |         | W/W43 |       |       |       |       |       | -2%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Wafer EAW Improvement I (MNR)                               | 3%          |         | W/W43 |       |       |       |       |       | 3%    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Wafer EAW Improvement II (WP4.1)                            | 3%          |         | W/W52 |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3%    |       |       |       |       |       |       |       |       |
| G6B Media Transition/Fuji FG3.2                             | 6%          |         | W/W02 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6%    |       |       |       |       |       |       |       |
| BP84.5 (BP85 Writer on BP84 Reader) heads                   | 6%          |         | W/W50 |       |       |       |       |       |       |       |       |       |       |       |       | 6%    |       |       |       |       |       |       |       |       |       |       |
| BP85 heads  | 4%          |         | W/W08 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 4%    |       |
| Total YIP   |             |         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Grenada 2T Actual Yield                                     |             |         |       | 48%   | 54%   | 48%   | 68%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LRP Grenada 2T Budget                                       |             |         |       | 51.7% | 52.5% | 53.2% | 54.1% | 54.7% | 55.3% | 55.8% | 56.4% | 57.0% | 57.6% | 58.2% | 58.7% | 59.3% | 59.9% | 60.5% | 61.0% | 61.7% | 62.3% | 63.0% | 63.7% | 64.4% | 65.0% | 65.7% |
| Grenada 2T Projected Yield                                  |             |         |       | 48%   | 54%   | 54%   | 54%   | 70%   | 56%   | 56%   | 56%   | 56%   | 56%   | 56%   | 56%   | 62%   | 62%   | 65%   | 65%   | 71%   | 71%   | 71%   | 71%   | 71%   | 71%   | 75%   |



| Grenada 3T Yield Improvement Plan                                   | Improvement | Fallout | When | WW33  | WW34  | WW35  | WW36  | WW37  | WW38  | WW39  | WW40  | WW41  | WW42  | WW43  | WW44  | WW45  | WW46  | WW47  | WW48  | WW49  | WW50  | WW51  | WW52  | WW01  | WW02  | WW03  |
|---|-------------|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| EC 12964; Heater Current retry when value of zero is returned (PF3) | 1.25%       | 2.3%    | WW38 |       |       |       |       |       | 1.25% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 14942; parameter change in AFH 35 (SF3)                          | 0.4%        | 0.8%    | WW38 |       |       |       |       |       | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10522; Disable SWD prior to Write_Screen (PF3)                   | 10%         | 12%     | WW38 |       |       |       |       |       | 10%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EC 10479; T94 detor register reload change (SF3)                    | 1.5%        | 2.9%    | WW41 |       |       |       |       |       |       |       |       | 1.5%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| EAW Spec  | -12%        |         | WW41 |       |       |       |       |       |       |       |       | -12%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| ATI/STE Spec  | -12%        |         | WW41 |       |       |       |       |       |       |       |       | -12%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Stability Spec  | -3%         |         | WW41 |       |       |       |       |       |       |       |       | -3%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Wafer EAW Improvement I (MNR)                                       | 4.5%        |         | WW43 |       |       |       |       |       |       |       |       |       | 4.5%  |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Wafer EAW Improvement II (WP4.1)                                    | 4.5%        |         | WW52 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.5%  |       |       |       |       |
| G6B Media Transition/Fuji FG3.2                                     | 9%          |         | WW50 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 9%    |       |       |       |       |       |
| BP#4.5 (BP#5 Writer on BP#4 Reader) heads                           | 9%          |         | WW50 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 9%    |       |       |       |       |       |
| BP#5 heads  | 6%          |         | WW08 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Total YIP   |             |         |      |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Grenada 3T Actual Yield   |             |         |      | 41%   | 43%   | 41%   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| LRP Grenada 3T Budget   |             |         |      | 36.3% | 37.1% | 38.0% | 38.8% | 39.6% | 40.5% | 41.3% | 42.2% | 43.1% | 43.8% | 44.4% | 45.1% | 45.7% | 46.4% | 47.1% | 47.7% | 48.4% | 49.0% | 49.7% | 50.4% | 51.0% | 51.3% | 51.5% |
| Grenada 3T Projected Yield  |             |         |      | 41%   | 43%   | 43%   | 43%   | 43%   | 55%   | 55%   | 55%   | 29%   | 29%   | 34%   | 34%   | 34%   | 34%   | 34%   | 34%   | 34%   | 52%   | 52%   | 56%   | 56%   | 56%   | 56%   |



## Grenada HGA Electrical Test Yield Projection FW1133 - 9A forecast



|                          | Feb-11 | Mar-11 | Apr-11 | May-11 | Jun-11 | Jul-11 | Aug-11 | Sep-11 | Oct-11 | Nov-11 | Dec-11 | Jan-12 | Feb-12 | Mar-12 | Apr-12 | May-12 | Jun-12 |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| FW1133 CYP (9A) - Cum    | 73%    | 75%    | 76%    | 76%    | 76%    | 79%    | 82%    | 84%    | 85%    | 87%    | 89%    | 90%    | 91%    | 93%    | 93%    | 94%    | 95%    |
| Actual yield- Total      | 76%    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| FW1133 CYP (9A) - Sort 6 | 49%    | 52%    | 53%    | 55%    | 57%    | 62%    | 66%    | 69%    | 71%    | 73%    | 75%    | 76%    | 78%    | 79%    | 80%    | 82%    | 82%    |
| Actual yield- S6         | 50%    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |

## Q3FY11

S6 outlook at 53% to a plan of 52%

Cum yield outlook of 76% to a plan of 75% for Q3FY11

Key improvements:

- G5B media (gain of 0.15 decade)
- ADC optimization (HGA to drive) for mass production wafer

## Q4FY11

S6 outlook at 57% by end Q4FY11

Cum yield outlook of 78% to a plan of 76% for Q3FY11

Underpinned yield improvement actions:

- Dual heater test implementation at HGA
- Optimized writer target for mass production wafer

## Q1/Q2FY12

Cum yield at 87% and S6 yield to 75% by end Q2FY12

- Critical path items include BP5.0 transducer and G6B media implementation





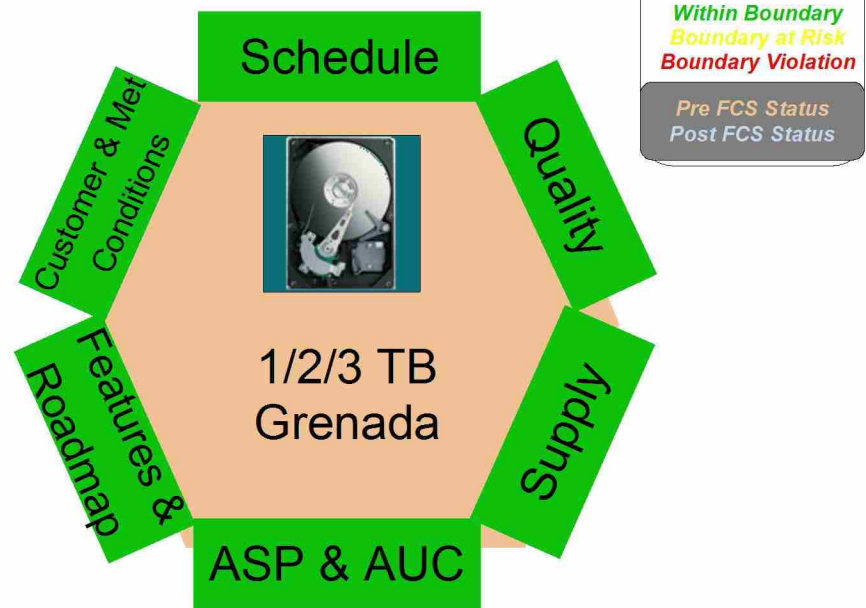
# Back Up



# Grenada SAD Milestones

| Functional Organization      | Deliverables  | MileStone | Criteria                          | Last Update | Current Status | Risk             | Owner           |
|------------------------------|---|-----------|-----------------------------------|-------------|----------------|------------------|-----------------|
| <b>1. Milestone Criteria</b> | 168-Hr DPPM Goal Achieved   | Yes       |                                   | 03/04/2011  | Not Posted     | No Risk Assigned | Glen            |
|                              | All contract items are within variance and projected to remain so   | Yes       |                                   | 03/04/2011  | Not Posted     | No Risk Assigned | Pat Dewey       |
|                              | Complexity Health Index - Does not deviate from Phase 0 Contract  | Yes       | A. CH Index Score<br>B. CC Budget | 04/21/2011  | Achieved       | Low Risk         | John Mortellaro |
|                              | Component sources defined on the SSP approved to AML level AB. Exceptions have defined/underpinned closure plans. Qualified Sources can support Master Schedule Requirements.                   | Yes       |                                   | 04/21/2011  | Achieved       | Low Risk         | Bob Kolanda     |
|                              | Exceptions to previous Phase Review closed  | Yes       |                                   | 03/04/2011  | Not Posted     | No Risk Assigned |                 |
|                              | Factory Prime Yields meet Phase 0 goal  | Yes       | Goal = xx% LP, xx% LD, xx% LDD    | 04/25/2011  | Achieved       | Low Risk         | Kevin Stenvall  |
|                              | Firmware/Compatibility Testing Complete<br>- All High Risk items fix validated.   | Yes       |                                   | 04/21/2011  | Achieved       | Low Risk         | Matt Sadafi     |
|                              | Gen 2/3 Product Assurance and Factory Testing Complete<br>- All High Risk items fix validated.  | Yes       |                                   | 03/04/2011  | Not Posted     | No Risk Assigned | Glen            |
|                              | Integration DPPM Goal Achieved  | Yes       |                                   | 03/04/2011  | Not Posted     | No Risk Assigned | Glen            |
|                              | Inventory / Material Disposition<br>- Complete roll-up of all Factory and DC pre-SAD config inventory/WIP/FG and Disposition  | Yes       |                                   | 04/22/2011  | Achieved       | Low Risk         | Bob Kolanda     |
|                              | MTBF Goal Achieved  | Yes       | SBS = 100K, Actual = XXX          | 03/04/2011  | Not Posted     | No Risk Assigned | Glen            |
|                              | Process Readiness Audit and Process Verification Test Results approved by the Volume Factory and Design Center.<br>- Includes QA Hardware/Software Readiness<br>- Includes Rework Qualification | Yes       |                                   | 04/27/2011  | Achieved       | Low Risk         | Kevin Stenvall  |
|                              | Product Stewardship Declaration of Compliance at a minimum of 95% completed.  | Yes       |                                   | 04/22/2011  | Achieved       | Low Risk         | Bob Kolanda     |
|                              | SLAM Deliverables completed and entered into ADD/DD database.   | Yes       |                                   | 04/22/2011  | In Progress    | Low Risk         | Pat Dewey       |





## SCHEDULE

- Grenada qualification on Rokit Desk and Home- Pass (Apr. 18)
- Target First HDD shipment on May 1

## QUALITY:

- RDT:
  - Project MTBF >= 100K Hrs in Week 43
  - Reliability Review with Retail on Apr. 22
- Joint Qualification Status:
  - QSI : Pass (both Rokit Desk and Home)
  - Raptor (USB 2 and USB 3): JQ to start in week 44
- Thermal retest with JIT 3 FW : pass
  - Thermal measurements meet 65C spec limit at system level; for GoFlex Desk and Go Flex Home

## SUPPLY:

- Q311: (WK44-45)
  - 3TB : 11K
  - 2TB: 23K

## ASP & AUC:

### Grenada TVC:

- Q411: 3TB: \$75 (vs. MantaRay \$91)
- Q112: 3TB: \$60 (vs. MantaRay \$80)

## FEATURES & ROADMAP:

- 2 and 3TB Barracuda Internal kits in Q1

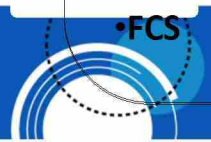
## CUSTOMER & MARKET CONDITIONS:

## MILESTONES

|   |       |
|---|-------|
| ✓ Pre CTU Shipment (for EMI)                  | 01/13 |
| ✓ CTU shipment (35X per product)              | 02/20 |
| ✓ SIE Qual start                              | 02/08 |
| ✓ Rokit 3.5" Joint Qual starts                | 02/25 |
| ✓ RDT Starts (Korat & LCO): 500 units         | 02/25 |
| ▪ Demo 100K MTBF                              | 04/25 |
| ✓ Rokit Desk/Home JQ complete                 | 04/18 |
| • 1 <sup>st</sup> shipment (35K units): Korat | 05/01 |
|   | 05/15 |

• FCS

• N/A



## Short Term CA

- MAT 2.0 test bed, running currently in Korat, has the following MD contact detect improvements:
  - ✓ Moved MD contact detect zones to higher skew
  - ✓ Increased revolutions at low skew zones (from 30 to 50) to improve contact detect SNR
  - ✓ Optimized AGC detector for Luxor 2 compatibility
  - ✓ Reduced FFT frequency binning to accommodate servo sample rate/ gimbal mode overlap
- MAT 2.0 currently through Baseline ODT and in RDT client (700 drives ~ 150 hrs) at Korat with two 47kHz failure
- 400 drives shipped to LCO for 5K feet modulated write fix effectiveness testing (0 47kHz failures ODT, RDT Client/ABT in test)

## Medium Term CA

- Characterization of modulated write susceptibility for NHK suspensions – preliminary data show no mode at 47kHz
- MD target Clearance Hump – RSS penalty under evaluation 5/29
- T227 (SWD) evaluation on failing drives – evaluation of failing drives in process (ECD 5/29)
- Reduce FFT frequency for AGC detector, concern over head instability impact. (TBD)
- Clearance Error with DETCR turned on (2-3A) additional margin, failures repeat, TVM inprogress

## Longer Term CA

- MPT suspension change to move gimbal frequencies away from 47kHz – RHO
  - ✓ Need to understand TDK performance
  - ✓ Need to understand UP versus Down suspension behavior differences observed
- Continue to explore advanced contact detect schemes that can deal with modes excited at servo sample rates (i.e 47kHz in current case)





| PFL       | SN       | HD_POS | HD_ID      | SBR          | TEST BED                    | TEST   | TTF       | P240 STATUS          | IMPLEMENTED P234 SPEC STATUS |
|-----------|----------|--------|------------|--------------|-----------------------------|--------|-----------|----------------------|------------------------------|
| 871       | Z1E00BKV | 2      | BD301WUII2 | TKGRD4HW40A  | 47kHz Modulated Write Eval  | ABT    | 11.5 hrs  | Does NOT Catch       | Does NOT Catch               |
| 875       | Z1E00BHC | 2      | BD301WT0D2 | TKGRD4HW40A  | 47kHz Modulated Write Eval  | ABT    | 29.6 hrs  | Does NOT Catch       | Does NOT Catch               |
| 853       | Z1F009A1 | 4      | C3G2UA9LY1 | KTGRD61093AR | MAT 2.0                     | BL_ODT | 14.0 hrs  | Does NOT Catch       | Does NOT Catch               |
| 876       | Z1E00BNF | 0      | BD302E8QJ2 | TKGRD4HW40A  | 47kHz Modulated Write Eval  | ABT    | 38.3 hrs  | Does NOT Catch       | Catches                      |
| 886       | Z1F0098Q | 0      | C3G2UAL4Q0 | KTGRD61093AR | MAT 2.0                     | BL_ODT | 149.9 hrs | Does NOT Catch       | Does NOT Catch               |
| 693       | Z1F00BL7 | 4      | C3G2WD4KY0 | TKRMO6H3DA   | Korat Recycled Media Qual   | BL_ODT | 31.5 hrs  | No Data              | Catches                      |
| 785       | Z1F00B7P | 3      | C3G2UDUYG0 | TKRMO6H3DA   | Korat Recycled Media Qual   | RDT-C  | 298.0 hrs | No Data              | Does NOT Catch               |
| 807       | Z1F002K6 | 2      | C3G2RYRHP1 | LCGRDATI3DA  | PCO 8.2 ATI Mitigation Eval | BL_ODT | 38.0 hrs  | Catches w/ 3.4 spec  | Catches                      |
| 914       | Z1F008M6 | 4      | C3G2UA9PS1 | KTGRD61093AR | MAT 2.0                     | RDT-C  | 164.5 hrs | Does NOT Catch       | Catches                      |
| 925       | Z1F00BQD | 1      | C3G2XQH2J1 | SBGRNPCO81R  | MAT 2.0                     | RDT-C  | 307.3 hrs | Catches w/ 4.4 spec  | Catches                      |
| RE/11/452 | Z1F004T1 | 4      | C3G2UFGYN1 | TKGRNCTU3D1A | GIO for CTU                 | GIO    |           | Catches w/ 3.3 spec  | Catches                      |
| 475       | Z1E004ED | 3      | C3G2UAXOB1 | KTGRD40400A  | MAT 1.4                     | BL_ODT | 10.9 hrs  | Does NOT Catch       | Does NOT Catch               |
| 498       | Z1E004EG | 1      | C3G2UAWJP1 | KTGRD40400A  | MAT 1.4                     | dRDT-C | 13.2 hrs  | Catches w/ 2.67 spec | Does NOT Catch               |
| 481       | Z1E004SR | 1      | C3G2UAT0Y1 | KTGRD40435A  | MAT 1.4                     | BL_ODT | 25.2 hrs  | Catches w/ 3.7 spec  | Catches                      |
| 446       | Z1F002K6 | 2      | C3G2RYRHP1 | KTGRD60625A  | MAT 1.4                     | dRDT-C | 18.9 hrs  | Catches w/ 3.4 spec  | Catches                      |
| RE/11/556 | Z1F0083M | 5      | C3G2UGVEC1 | KTGRD61120A  | GIO for MAT 1.4             | GIO    |           | Catches w/ 2.3 spec  | Catches                      |
| RE/11/508 | Z1F0083R | 3      | C3G2UAC2I1 | KTGRD61120A  | GIO for MAT 1.4             | GIO    |           | Catches w/ 3.7 spec  | Catches                      |
| 536       | Z1F004W3 | 1      | C3G2UA7GQ0 | KTGRD61120B  | MAT 1.4                     | BL_ODT | 32.6 hrs  | No Data              | Catches                      |
| 507       | Z1F00522 | 2      | C3G2UAE2W0 | KTGRD61120B  | MAT 1.4                     | BL_ODT | 7.8 hrs   | Catches w/ 1.8 spec  | Catches                      |
| 508       | Z1F00537 | 5      | C3G2UAYLF1 | KTGRD61120B  | MAT 1.4                     | BL_ODT | 9.8 hrs   | No Data              | Does NOT Catch               |
| 963       | Z1E00BT4 | 0      | BD301WU5Y1 | TKGRD4HW40A  | 47kHz Modulated Write Eval  | ABT    | 130.6 hrs | Does NOT Catch       | Catches                      |
| 959       | W1F00118 | 0      | C3G2UDWGO1 | WUGRS60949A  | Kaifa Rwork HSA Qual        | TVM    | 24.6 hrs  | No Data              | Catches                      |
|           | Z1E007L7 | 0      | C3G2UA73Q1 | TKGRN4H2B2   | ??                          | GIO    |           | Does NOT Catch       | Does NOT Catch               |

## MAT 2.0:

- 4 EAW failures seen to date in MAT 2.0. This is after CQ based sorting for gEAW at HGA ET.
- Test 234 spec designed to capture failures. Based on MAT 2.0, MAT 1.4, and recent EAW failures from other test beds, spec is ~ 59% effective.
  - In PCO 8.6 – already sent to the factory.
  - Cost is ~ 1.1% on a head-level basis. ~ 6% expected nominally on 6-header drives with swings from 1% to >10% fallout depending on heads in specific SBRs. BtC Yield fallout will be larger.
  - Test 240 effectiveness is poorer and Yield cost is higher.
  - Experiments to improve EAW performance under way: Expect Completion by FW44. Transition to Test 240 based spec after EAW levels are reduced.
  - Also investigating Super CQ spec at HGA in addition to established CQ specs for gEAW.



## Grenada - DR/Product Manual Compliance (Page 1 of 5)

|                                       |   |                  |                  |                  |                  |                  |   | SBS Info |
|---------------------------------------|---|------------------|------------------|------------------|------------------|------------------|---|----------|
| Shock and Vibration                   | Spec.   | Gen 1<br>1000 GB | Gen 1<br>1500 GB | Gen 1<br>2000 GB | Gen 1<br>2500 GB | Gen 1<br>3000 GB | Comments / Corrective Action Description EM   | SBS Req. |
| Topple Drop                           | 1/2 Disc: 120 degrees<br>2/3 Disc: 90 degrees           | 0 / 5            | NPIP             | NPIP             | NPIP             | 0 / 5            |   | Y        |
| Operating Vibration - Random          | No Spec   | 0 / 12           | NPIP             | 0 / 3            | NPIP             | 0 / 3            |   | Y        |
| Operating Vibration - Linear Random   | 80% TPT @ .004 G2/Hz (5-500 Hz)<br>1.4 GRMS (ref)       | 0 / 12           | NPIP             | 0 / 3            | NPIP             | 0 / 3            |   | Y        |
| Operating Vibration - Rotary Random   | 80% TPT 12.5 rad/sec <sup>2</sup> @ 10 - 1500 Hz        | 0 / 12           | NPIP             | 0 / 3            | NPIP             | 0 / 3            | Non-HP (8.5 ?). RVFF needed for HP 12.5 spec.   | Y        |
| Operating Shock Six Axis 2 ms         | 40 G's  | 0 / 9            | 0 / 3            | 0 / 6            | NPIP             | 1 / 6<br>FE 0%   | Op Shock Write Failure @ 80Gs   | Y        |
| Non-Operating Shock Six Axis (.5msec) | 200 G's   | NPIP             | NPIP             | 0 / 3            | NPIP             | ECD 5/1          |   | Y        |
| Non-Operating Shock Six Axis (1msec)  | 300 G's   | NPIP             | NPIP             | ECD 5/1          | NPIP             | ECD 5/1          |   | Y        |
| Non-Operating Shock Six Axis (2msec)  | 1/2 Disc: 350 G's<br>2/3 Disc: 300 G's                  | 0 / 6            | 0 / 6            | NPIP             | NPIP             | 0 / 3            |   | Y        |
| <b>4 Corner</b>                       |   |                  |                  |                  |                  |                  |   |          |
| Thermal Voltage Margins               | 0 - 60C / 5%, 10% Voltage limits                        |                  | NPIP             |                  | NPIP             |                  | PCO 8.0 Checkout Results: 85% Pass. Projected 92% Pass. Additional PCO 8.2 drives will be tested in Suzhou ww42 | Y        |
| <b>Environmental Stress</b>           |   |                  |                  |                  |                  |                  |   |          |
| Accelerated Storage Test 60C/80RH     | 21 Day - 60C/80% RH                                     | 1/22             | 0 / 10           | 0 / 22           | NPIP             | 1/22             | 1x Defect, 1x Modulated Write (LCO)   |          |
| Transit Storage Environment           | -40-36C/10-90% RH                                       | 0 / 10           | NPIP             | 0 / 6            | NPIP             | 0 / 6            |   | N        |
| Hot Storage Test                      | 72 hrs - 85C/40% RH<br>(Pass Criteria of <5% Fail Rate) | NPIP             | NPIP             | 1 / 21           | NPIP             | NPIP             |   | Y        |





## Grenada - DR/Product Manual Compliance (Page 2 of 5)

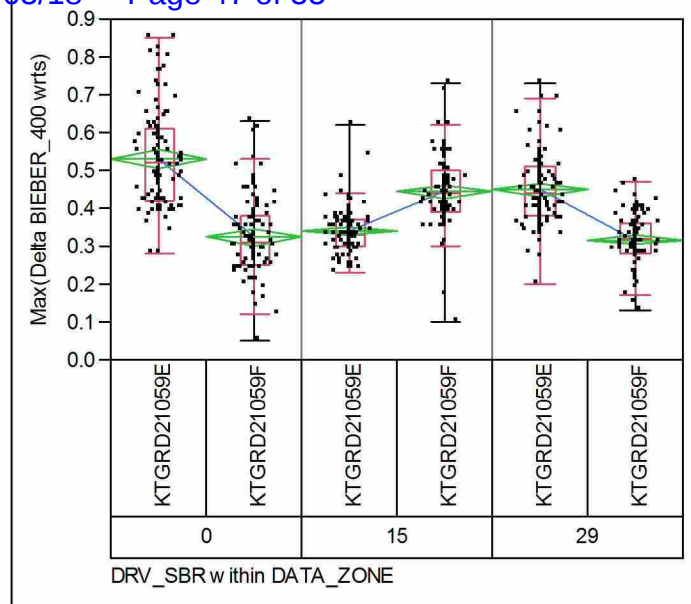
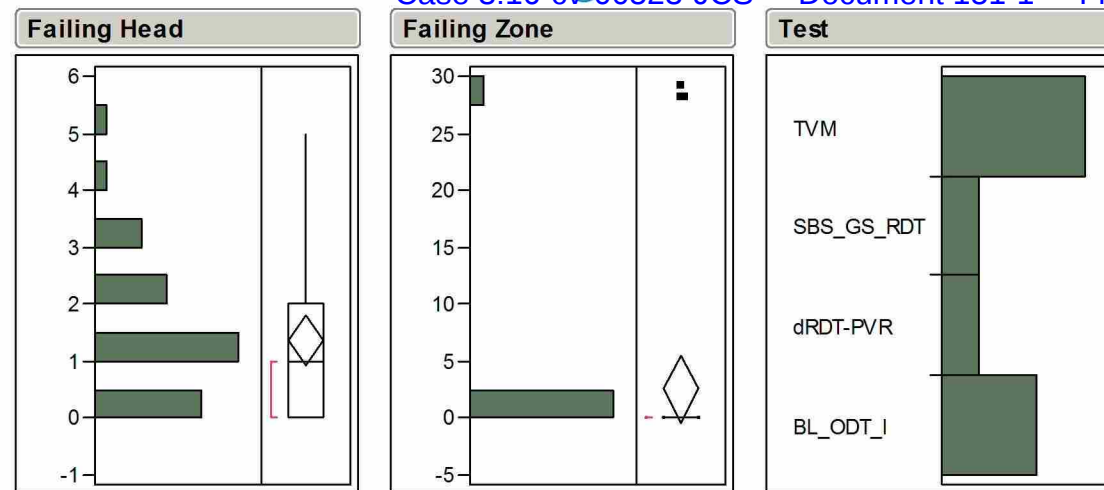
| Head/Media Interface             | Spec.                                   | Gen 1<br>1000 GB | Gen 1<br>1500 GB | Gen 1<br>2000 GB | Gen 1<br>2500 GB | Gen 1<br>3000 GB | Comments / Corrective Action Description EM                               | SBS Info |
|----------------------------------|---|------------------|------------------|------------------|------------------|------------------|---|----------|
|                                  |   |                  |                  |                  |                  |                  |   | SBS Req. |
| Altitude                         | -200-40000                              | NPIP             | NPIP             | ECD 4/18         | NPIP             | 0 / 4            | 1 Failure on 2D. Drive in Retest.   | Y        |
| Ambient L/U/L Soft               | 300K cycles/600K Margin                 | NPIP             | NPIP             | ECD 5/1          | ECD 3/30         | ECD 5/1          |   |          |
| Stress L/U/L Soft                | 300K cycles/600K Margin<br>(32C, 80%RH) | NPIP             | NPIP             | ECD 5/1          | ECD 3/30         | ECD 5/1          | 2 Failures. 1x Degraded Head @ 279k cycles. 1x Seek Timeout @ 284k cycles |          |
| Stress L/U/L Soft                | 300K cycles/600K Margin<br>(5C, 20%RH)  | NPIP             | NPIP             | ECD 5/1          | ECD 3/30         | ECD 5/1          |   |          |
| Stress L/U/L Soft                | 600K cycles/1.2M Margin<br>(60C, 20%RH) | NPIP             | NPIP             | ECD 5/1          | ECD 4/10         | ECD 5/1          |   |          |
| Stress L/U/L Soft                | 300K cycles/600K Margin<br>(5C, 20%RH)  | NPIP             | NPIP             | ECD 5/1          | NPIP             | ECD 5/1          |   |          |
| Ambient L/U/L Hard               | 50K cycles                              | NPIP             | NPIP             | ECD 5/1          | NPIP             | ECD 5/1          |   |          |
| Stress L/U/L Hard                | 20K cycles (5-55C, 8-80%RH)             | NPIP             | NPIP             | ECD 5/1          | NPIP             | ECD 5/1          |   |          |
| Stress L/U/L Hard                | 20K cycles (5-55C, 8-80%RH)             | NPIP             | NPIP             | ECD 5/1          | NPIP             | ECD 5/1          |   |          |
| Stress L/U/L Hard                | 20K cycles (5-55C, 8-80%RH)             | NPIP             | NPIP             | ECD 5/1          | NPIP             | ECD 5/1          |   |          |
| <b>Power</b>                     |   |                  |                  |                  |                  |                  |   |          |
| DC Current and Power Consumption | 2.8A Max                                | 10 / 25<br>FE 0% | NPIP             | 2 / 5<br>FE 0%   | NPIP             | 5 / 5<br>FE 0%   | Sleep/Stndby exceeding spec   | Y        |
| Power Loss Recovery              | +/- 10% on 12V, +/- 5% on 5V            | 0 / 25           | NPIP             | 0 / 5            | NPIP             | 0 / 5            |   | Y        |
| Power Supply Ramping             |   | 0 / 25           | NPIP             | 0 / 5            | NPIP             | 0 / 5            |   | Y        |
| DC Ripple and Conducted Noise    | 5V (100mV), 12V (120mV)                 | 0 / 25           | NPIP             | 0 / 5            | NPIP             | 0 / 5            |   | Y        |
| PCBA Thermal Map                 |   | NPIP             | NPIP             | NPIP             | NPIP             | 0 / 2            |   | Y        |



## Grenada - DR/Product Manual Compliance (Page 3 of 5)

| Packaging                                       | Spec.  | Gen 1<br>1000 GB | Gen 1<br>1500 GB | Gen 1<br>2000 GB | Gen 1<br>2500 GB | Gen 1<br>3000 GB | Comments / Corrective Action Description EM                              | SBS Info |
|---|--|------------------|------------------|------------------|------------------|------------------|--|----------|
|   |  |                  |                  |                  |                  |                  |  | SBS Req. |
| Free Fall Impact                                |  | TBD              | NPIP             | TBD              | NPIP             | TBD              | Issues with shaker table in Thailand. Date TBD                           | Y        |
| <b>Mechanical</b>                               |  |                  |                  |                  |                  |                  |  |          |
| Crash Stop Impact                               |  | TBD              | NPIP             | NPIP             | NPIP             | NPIP             | Pending Servo Code   | N        |
| Weight and Dimensions                           |  | 0 / 5            | NPIP             | 0 / 5            | NPIP             |                  | 3D config failing for Z-Height out of spec                               | Y        |
| <b>Agency</b>                                   |  |                  |                  |                  |                  |                  |  |          |
| ElectroMagnetic Compatibility                   |  | NPIP             | NPIP             | NPIP             | NPIP             |                  | SBS Required CERTs Complete. Formal EMC Passed, reports are in progress. | Y        |
| Electro-Static Discharge - Op (Stand Alone)     | 8kV contact, 15 kV air. (in system)                        | 0 / 2            | NPIP             | NPIP             | NPIP             | 0 / 2            |  | Y        |
| Electro-Static Discharge - Non Op (Stand Alone) | 8kV contact, 15 kV air. (in system)                        | 0 / 2            | NPIP             | NPIP             | NPIP             | ECD 4/13         |  | Y        |
| Safety Certification                            |  | NPIP             | NPIP             | NPIP             | NPIP             |                  | SBS Required CERTs Complete. Formal EMC Passed, reports are in progress. | Y        |
| Radiated Emmision (Stand Alone)                 |  | NPIP             | NPIP             | NPIP             | NPIP             |                  | SBS Required CERTs Complete. Formal EMC Passed, reports are in progress. |          |
| <b>Acoustics</b>                                |  |                  |                  |                  |                  |                  |  |          |
| Acoustic Sound Power                            | Idle:1D(2.4/2.6)/2D(2.5/2.7)<br>3D(2.6/2.8)/4D(2.8/3.0)    | 0 / 100          | NPIP             | 0 / 50           | 0 / 24           | 0 / 70           |  | Y        |
| PDT Prominence Ratio                            | 9 dB   | 1 / 40           | NPIP             | 0 / 10           | 0 / 10           | NPIP             |  | Y        |
| Acoustic L/LUL                                  | 1/2 Disc: 38 (dB)/3.0 Sones<br>3/4 Disc: 42 (dB)/3.4 Sones | 0 / 20           | 0 / 5            | 1 / 5            | 0 / 5            | 0 / 5            |  | Y        |
| Acoustic Latch - Power off Retract              | 1/2 Disc: 46 (dB)/3.3 sones<br>3/4 Disc: 50 (dB)/3.7 sones | 1 / 20<br>FE 0%  | 2 / 5<br>FE 0%   | 2 / 5<br>FE 0%   | 2 / 5<br>FE 0%   | 0 / 5            |  |          |





### Analysis of 33 recent ATI failures:

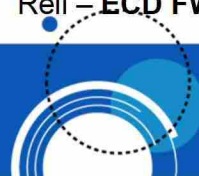
- Bacall MAT 1.1 and Grenada MAT 1.4 and Korat HSA Qual Test Beds.
- Failures at extreme OD and extreme ID. No clear upstream signatures noted.
- Clear evidence of compromised TPI margins at extremal skews.

### Mitigation Steps Taken:

- Re-Warp the TPI profile to afford greater margin at extremal skews – **Done**. In **PCO8.2** – to be sent to factory **3/30** at the latest. **Target FVT**.
  - ATI margin and distributions improved dramatically relative to older TPI Warp.
- Modifications to BIE-DOS settings (Mike Schaff).
  - DOS scans more aggressive with reduction in # of iterations from 15 to 10, and lowering of BIE threshold for refreshes from 50 to 8.
  - Validated on bench to recover 3 out of 4 PFLs.
  - Code in checkout in SIE prior to release for **MAT 2.0 and FVT**.
  - Changes will be implemented in Bacall as well.

### Validation Steps:

- 14x 1D and 11x 3D confirmed ATI failures are being re-CERT'ed with **PCO 8.2**. Will be flashed with latest **BIE-DOS F3** code and validated in Reli – **ECD FW40**.



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Seagate Confidential – Special Handling



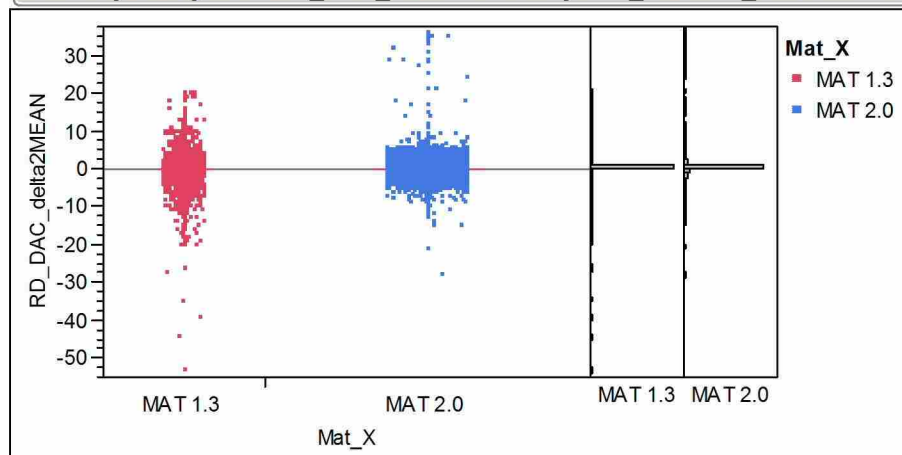
HIGHLY CONFIDENTIAL

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- Charts below show the improvement of variation of a heads individual contact profile to that of the average head.
- A small mean shows less contact profile variation from head to head.
- MAT2.0 code shows significant improvements with contact profile variation

Fit Y by X Group

Oneway Analysis of RD\_DAC\_delta2MEAN By Mat\_X MSRD\_INTRPLTD=I



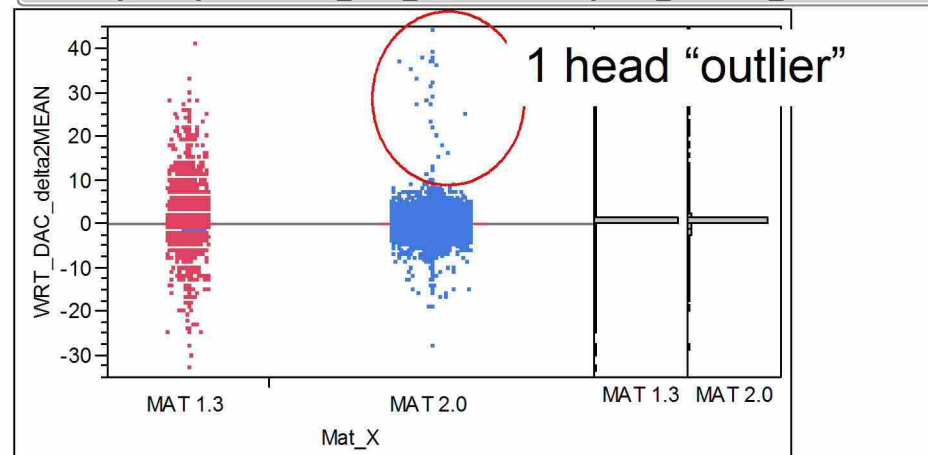
## Quantiles

| Level   | Minimum | 10%  | 25% | Median | 75% | 90%      | Maximum |
|---------|---------|------|-----|--------|-----|----------|---------|
| MAT 1.3 | -53     | 0    | 0   | 0      | 0   | 0        | 20      |
| MAT 2.0 | -28     | -0.5 | 0   | 0      | 0   | 0.666667 | 37      |

## Means and Std Deviations

| Level   | Number | Mean     | Std Dev  | Std Err Mean | Lower 95% | Upper 95% |
|---------|--------|----------|----------|--------------|-----------|-----------|
| MAT 1.3 | 152070 | -0.03898 | 0.782358 | 0.00201      | -0.0429   | -0.0350   |
| MAT 2.0 | 305070 | 2.95e-5  | 0.893791 | 0.00162      | -0.0031   | 0.0032    |

Oneway Analysis of WRT\_DAC\_delta2MEAN By Mat\_X MSRD\_INTRPLTD=I



## Quantiles

| Level   | Minimum | 10%  | 25% | Median | 75% | 90%      | Maximum |
|---------|---------|------|-----|--------|-----|----------|---------|
| MAT 1.3 | -33     | 0    | 0   | 0      | 0   | 0        | 41      |
| MAT 2.0 | -28     | -0.5 | 0   | 0      | 0   | 0.666667 | 44      |

## Means and Std Deviations

| Level   | Number | Mean     | Std Dev | Std Err Mean | Lower 95% | Upper 95% |
|---------|--------|----------|---------|--------------|-----------|-----------|
| MAT 1.3 | 152070 | 0.019320 | 1.06721 | 0.00274      | 0.0140    | 0.02468   |
| MAT 2.0 | 305070 | 0.003107 | 0.95989 | 0.00174      | -0.0003   | 0.00651   |





|       | W W 44              | W W 45 | W W 46 | W W 47 | W W 48 | W W 49 | W W 50 | W W 51 | W W 52 |
|-------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| R D T | B u i l d / C e r t |        |        |        |        |        |        |        |        |
|       |                     |        |        |        |        |        |        |        |        |

WW48 Korat 500 hours, Risk Check Point

WW51 Korat 1K hours, Check Point

- Recommend that we remove Disty Volume from Q4.
- RDT build start in WW44, drives into Reli WW45, with 500hr check point in WW48.
  - Assumes that we are comfortable with 47Khz containment, solution!





# Grenada DT Complexity

John Mortellaro  
April 7, 2011



Continue the strategy from Pharaoh with new learning

- Current BOMs SBS & Disty: 100% HDA and PCBA usage
- Eliminated restrictions for non-LH and no top cover damper
- Std OEM: 19 of 24 customers including Dell
  - Potential risk: NEC, Samsung and Sony dppm and FW changes
  - Potential risk: Dell will be Std OEM at launch, FW learning's from Tier 2 & 3 qualifications
- RVFF: HP with RVFF, Apple potential risk
- Other Key Potential Risks:
  - Suzhou quality
  - Apple acoustic, multiple head configs (ex. 6H, 5H & 4H- 2TB)
  - Special tests or components to improve customer quality



# Grenada Restriction Risk & Opportunity

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**Grenada Customer and Internal Restriction Matrix**

| Restriction           | Disty      | STD OEM   | Dell      | HP               | Lenovo    | Apple                               | FSC      | Samsung  | NEC               | Sony    | Pace     | SV-STD OEM | SBS- NAS             | SBS      |
|-----------------------|------------|-----------|-----------|------------------|-----------|-------------------------------------|----------|----------|-------------------|---------|----------|------------|----------------------|----------|
| FY12 Volumes          | 28,979,029 | 4,445,575 | 7,507,500 | 7,374,900        | 5,191,875 | 897,000                             | 273,000  | 263,250  | 243,750           | 117,000 | -        |            | 620,000              |          |
| Media                 |            |           |           |                  |           |                                     |          |          |                   |         |          |            |                      |          |
| HSA's                 |            |           |           |                  |           |                                     |          |          |                   |         |          |            |                      |          |
| MBA                   |            |           |           |                  |           |                                     |          |          |                   |         |          |            |                      |          |
| Cover                 |            |           |           |                  |           | unique damper cover                 |          |          |                   |         |          |            |                      |          |
| HDA's                 |            |           |           |                  |           | WF and Depop HDA's                  |          |          |                   |         |          |            |                      |          |
| PCBA                  |            |           |           | RVFF             |           | RVFF, Pharaoh PCBA, 0 ohm resistors |          |          |                   |         |          |            |                      |          |
| Balance Control       |            |           |           | FBP1<12.5 (98%)  |           | FBP1<12.5 (98%)                     |          |          |                   |         |          |            |                      |          |
| GOTF                  |            | OEM       | OEM       | OEM              | OEM       | OEM                                 | OEM      | OEM      | OEM               | OEM     | OEM      | OEM        |                      |          |
| T25 screen            |            |           |           |                  |           |                                     |          |          |                   |         |          |            |                      |          |
| Customer Special Test |            | Dell FRD  | Dell FRD  | 10G screen, 1M0s |           | Blue nun test ATI test (7hrs/Disc)  |          |          |                   |         |          |            | fullsurface 0 screen |          |
| FW                    | CCD4       | CCD4      | CCD4      | HP01             | CCD6 DST  | AP01                                | CCD4     | CCD4     | CCD4 OS not found | CCD4    | CCD4     | CCD4       | CCD4                 | CCD4     |
| Mfg Site              | WX/SZ/KT   | WX/SZ/KT  | WX/SZ/KT  | WX/SZ/KT         | WX/SZ/KT  | WX/KT                               | WX/SZ/KT | WX/SZ/KT | WX/KT             | WX/KT   | WX/SZ/KT | WX/SZ/KT   | WX/SZ/KT             | WX/SZ/KT |

|         |     |    |     |     |    |    |    |    |    |    |    |    |    |    |
|---------|-----|----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| Remark: | 52% | 8% | 13% | 13% | 9% | 2% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
|---------|-----|----|-----|-----|----|----|----|----|----|----|----|----|----|----|

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  | No restriction on this part            |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Customer Restriction on this part      |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Seagate Restriction on this part       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Potential restriction risks on Grenada |  |  |  |  |  |  |  |  |  |  |  |  |  |

Volumes are current Pharaoh volumes

Actions/ watch items:

1. Evaluate the differences in GOTF, can we consolidate? Consolidate to OEM and Std only
2. Apple does not want to take 6H and 5H 2TBs, need to highlight in DR and provide data to convince them
3. HP and Lenovo prefer not to have depop configs. Add depops to RDT, not required in CTUs?
4. Additional non- customer required screens/ test that are put in to maintain quality levels, review current screens/ tests that are being done on Pharaoh/ Bogart
5. Improve quality levels at Suzhou, currently DQ'd on Pharaoh at Apple, internal restriction to NEC and Sony
7. Apple Acoustic and PCBA restrictions. Need to test acoustics and frequency in Gen2
8. FW SBS and Disty on JIT3 for SBS Thermal and maintain performance for Disty



| CC Summary |    |                       |
|------------|----|-----------------------|
| Actual     | 0  |                       |
| Budget     | 80 | Commit at Phase 0     |
| Forecast   | 54 | Current Forecast      |
| Delta      | 26 | Budget minus Forecast |

| CH Index Summary |     |                       |
|------------------|-----|-----------------------|
| Actual           | 0   |                       |
| Budget           | 296 | Commit at Phase 0     |
| Forecast         | 90  | Current Forecast      |
| Delta            | 206 | Budget minus Forecast |

| CH Ratio Summary |      |                       |
|------------------|------|-----------------------|
| Actual           | 0.00 |                       |
| Budget           | 3.70 | Commit at Phase 0     |
| Forecast         | 1.67 | Current Forecast      |
| Delta            | 2.03 | Budget minus Forecast |

| BASE CONFIGURATIONS |       |           |         |
|---------------------|-------|-----------|---------|
| Capacity            | Cache | Interface | Configs |
| 3000                | 1     | 1         | 1       |
| 2500                | 1     | 1         | 1       |
| 2000                | 1     | 1         | 1       |
| 1500                | 1     | 1         | 1       |
| 1000                | 1     | 1         | 1       |
| 750                 | 1     | 1         | 1       |

6 Standard Tabs

| Configuration Driver Report                      |  | Total |
|--|--|-------|
| Base Number of Configurations: SBS               |  | 6     |
| Customer Unique Code<br>Apple, HP, Dell, Lenovo, |  | 24    |
| Customer Unique Labeling: Std OEM. Japanese OEMs |  | 12    |
| Disty: Seagate/ Maxtor                           |  | 12    |
| Total Configurations                             |  | 54    |

## Risks:

- NEC, Sony and Samsung dppm and FW changes that could occur during qualification
- Dell on Std OEM at launch, FW improvements learned during qualification



## Current Restriction Report

| Restriction Category    | Restriction Detail                                   | Reason Category                       | Qty of Restr            | Weight | CC's Affected | CHI Score | Action   | Owner | Relief Date |
|-------------------------|--|---------------------------------------|-------------------------|--------|---------------|-----------|--|-------|-------------|
| HDA Restriction         | Disty and SBS with no top cover damper for cost save | Customer Unique Requirement           | 0                       | 7      | 0             | 0         | Top cover damper not on Disty and SBS for cost savings | NA    | NA          |
| HDA Restriction         | Disty and SBS with no top cover damper for cost save | To Meet Customer Quality Requirements | 0                       | 7      | 12            | 0         | Top cover damper not on Disty and SBS for cost savings | NA    | NA          |
| PCBA Restriction        | Disty and SBS with non-LH PCBAs for cost save        | Implement Cost Savings                | 0                       | 3      | 12            | 0         | Non-LH PCBA for cost savings on Disty and SBS          | NA    | NA          |
| PCBA Restriction        |  | Customer Unique Requirement           | 0                       | 3      | 0             | 0         |  | NA    | NA          |
| PCBA Restriction        |  | To Meet Customer Quality Requirements | 0                       | 3      | 0             | 0         |  | NA    | NA          |
| PCBA Restriction        |  | Customer Unique Requirement           | 0                       | 3      | 0             | 0         |  | NA    | NA          |
| PCBA Restriction        |  | Customer Unique Requirement           | 0                       | 3      | 0             | 0         |  | NA    | NA          |
| Test Screen Restriction | Apple requires Blue Nun test                         | Customer Unique Requirement           | 1                       | 3      | 12            | 36        | None   | NA    | NA          |
| Test Screen Restriction | Apple require full pack zero pattern format          | Customer Unique Requirement           | 1                       | 3      | 12            | 36        | None   | NA    | NA          |
| Test Screen Restriction | HP 20M Zeros 1st and last                            | Customer Unique Requirement           | 1                       | 3      | 6             | 18        | None   | NA    | NA          |
| Top Cover Restriction   |  | Customer Unique Requirement           | 0                       | 7      | 0             | 0         |  | NA    | NA          |
| Test Screen Restriction |  | Customer Unique Requirement           | 0                       | 3      | 0             | 0         |  | NA    | NA          |
|                         | Total Active CCs                                     | 54                                    | Complexity Health Index |        |               | 90        |  |       |             |
|                         | Total CCs affected                                   | 54                                    | Complexity Health Ratio |        |               | 1.67      |  |       |             |
|                         | Unrestricted CCs                                     | 0                                     |                         |        |               |           |  |       |             |
|                         | Total Restrictions                                   | 3                                     |                         |        |               |           |  |       |             |
|                         | Closed Restrictions                                  | 0                                     |                         |        |               |           |  |       |             |
|                         | Restrictions with closure plan                       | 0                                     |                         |        |               |           |  |       |             |
|                         | Restrictions that require closure plan               | 0                                     |                         |        |               |           |  |       |             |
|                         | Non-Closeable due to Customer/Marketing Requirement  | 3                                     |                         |        |               |           |  |       |             |
|                         | Non-Closeable due to Cost Savings / Other            | 0                                     |                         |        |               |           |  |       |             |



# Change log

Changes from Phase 0:

7April 2011

Changes from Gen1

Reduced CCs from 80 to 54 by rolling FTS, Sony and Dell into Std OEM

Removed cover damper and non-LH restrictions

